SITE REASSESSMENT REPORT

LOWER SAN MATEO CREEK BASIN SITE
CIBOLA & MCKINLEY COUNTIES, NEW MEXICO
CERCLIS ID NMN000606847

September 2015

New Mexico Environment Department
Ground Water Quality Bureau
Superfund Oversight Section

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1 Introduction

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 United States Code (U.S.C.) §§ 9601 to 9675, the New Mexico Environment Department (NMED) Superfund Oversight Section (SOS) conducted a Site Reassessment (SR) at the Lower San Mateo Creek Basin Site, CERCLIS ID NMN000606847, (hereafter referred to as the "Site"), in Cibola and McKinley Counties, New Mexico.

The objective of this SR was to acquire recent ground water data to evaluate current water quality conditions; compare contaminant concentrations in the ground water samples to federal drinking water standards and State of New Mexico ground water quality standards; and expand the database of aquifer geochemistry information to support ongoing investigations of potential legacy uranium sites within the San Mateo Creek (SMC) basin and the Grants Mining District.

2 Site Description

2.1 Location

The Site is located in the southern half of the SMC basin in north-central Cibola County and southeastern McKinley County, New Mexico. The Site geographic coordinates (in degrees, decimal minutes) encompass an approximate area from 35°10.207' (south latitude) to 35°21.273' (north latitude) and 107°46.197' (east longitude) to 107°56.184' (west longitude). The elevation across the Site ranges from approximately 6,550 feet to 7,000 feet above mean sea level (MSL). Figure 1 shows the location of the Site investigation area in the SMC basin.

2.2 Site Description

The Site includes the five residential subdivisions (Broadview Acres, Murray Acres, Pleasant Valley Estates, Felice Acres, and Valle Verde) and other residential wells located on rural properties predominantly west, east, south, and north of the HMC site. Within the five subdivisions and generally farther south and west, the land use is predominantly rural residential with some ranching for crop agriculture and livestock, and commercial uses.

The Grants area has an arid high desert climate where the average annual precipitation for the Grants area is 10.40 inches. The maximum average precipitation of 2.03 inches occurs in August, and the minimum average precipitation of 0.44 in. occurs in February. Average annual snowfall is 12.3 inches, with the average maximum snowfall of 4.1 inches occurring in December. Evaporation exceeds precipitation throughout the region, and evapotranspiration is more than 30 inches of water in an average year. The average annual maximum temperature at the Grants Airport is 67.8° F, and the average maximum temperature of 88.4° F occurs in July. The average annual minimum temperature is 33.0° F, and the average minimum temperature of 14.4° F occurs in December.

2.3 Operational History, Waste Characteristics, and Previous Environmental Investigations

Uranium mining has occurred in the San Mateo Creek basin and Ambrosia Lake area beginning in early 1950s through mid-1980s. The legacy mining operations included the discharge of mine dewatering water to the area's surface water courses and arroyos (see Figure 1).

Murray (1945) (Ref. 1) made a reconnaissance study of ground water in the area near the town of Bluewater for irrigation and identified three primary aquifers: the basalt, the alluvium, and the Permian limestone and sandstone. The Bluewater Underground Water Basin was declared by the State Engineer on May 21, 1956 to regulate the use of ground water in the basin. Gordon (1961) (Ref. 2) conducted a detailed study of the Bluewater-Grants area to evaluate water quality, declining water levels, and the availability of ground water for future use.

In 1975 the U.S. Environmental Protection Agency (EPA) assessed the impacts of waste discharges from uranium mining and milling on ground water in the Grants Mining District with a focused sampling investigation on the Anaconda, Homestake, and Ambrosia Lake mill sites. Gallaher and Cary (1986) (Ref. 3) described regional sampling conducted by the New Mexico Environmental Improvement Division (predecessor agency of NMED) from 1977 to 1982 and assessed the impacts of the uranium industry on surface and shallow ground water.

Two inactive mill sites that processed uranium ores are located in the vicinity of the Site. They are the Anaconda Bluewater Mill (Bluewater Disposal Site) and the Homestake Mill (Homestake Mining Company (HMC) Superfund site (CERCLIS ID NMD007860935)), which began operations in the 1950s. Historical operations and previous environmental investigations at these inactive mill sites are described below. Two additional inactive uranium mills, the Phillips Mill and Rio Algom-Ambrosia Lake Mill operated north (upgradient) of the Site in the Ambrosia Lake area. These mills are not discussed in this report as they are located outside the study area.

Bluewater Disposal Site
The Anaconda Copper Company constructed the uranium mill at the Bluewater site in 1953 and began processing uranium ore in limestone using a carbonate-leach system. The mill switched to an acid-leach system in 1955 to process sandstone ore from the Jackpile Mine located near Laguna, New Mexico. The mill was located northwest of the Site investigation area and approximately two miles northeast of the Village of Bluewater, New Mexico (see Figure 1). Tailings from the acid-leach process were disposed in a natural basin north of the mill in an area with geologic faults that provided conduits for tailings liquid to seep into and mix with natural ground water in the alluvial and bedrock aquifers. To reduce the amount of tailings seepage into the underlying aquifers, Anaconda disposed of tailings liquid in a deep injection well located north of the main tailings impoundment from 1960-1977. In 1977 the Atlantic Richfield Company (ARCO) purchased the Bluewater mill, and in 1978 the Uranium Mill Tailing Radiation Control Act (UMTRCA) designated the Bluewater mill as a Title II site. UMTRCA Title II sites are transferred to the federal government or state in which a mill is located for long-term management once the site remediation is deemed complete by the NRC.

Active milling of uranium ore ended in 1982 and ARCO submitted a decommissioning plan to the NRC in 1987. Surface reclamation, tailings stabilization, and decommissioning were completed in 1995, and ARCO estimated that approximately 5.7 billion gallons of tailings fluids seeped from the main tailings impoundment prior to encapsulation in 1995 (Ref. 4), with about 2.7 billion gallons occurring prior to 1960 when deep-well injection began (Ref. 5). ARCO applied to the NRC for alternate concentration limits (ACLs) for uranium in the alluvial and San Andres aquifers (0.44 mg/L and 2.15 mg/L, respectively). NRC approved ARCO's request for ACLs, deemed the site remediated, terminated the source material license, and transferred the site to the U.S. Department of Energy (DOE) Legacy Management (LM) program for long-term monitoring and management. ARCO installed monitoring wells at the site and monitored nearby private off site wells for mill contamination during active milling and decommissioning. The DOE uses a total of nine monitoring wells for compliance monitoring of the two aquifers.

In 2008, the New Mexico Environment Department (NMED) conducted a Site Investigation (SI) of the Bluewater Disposal Site, and the San Andres wells were sampled for an expanded list of metals and radionuclides (Ref. 6). However, laboratory results from the water samples for uranium were below detection limits. NMED subsequently reviewed well construction diagrams and sampling protocol for representative sampling and determined that the sampling results for uranium were suspect and not representative of the true ground water quality of the San Andres Aquifer beneath the site. DOE conducted their own analysis of the well construction, sampling protocol, and laboratory results and concluded the integrity of the monitoring wells to yield a representative sample was compromised and that there were also gaps in the monitoring network (Ref. 4).

During 2011-2012, DOE installed and sampled six new San Andres aquifer wells and four new alluvial wells at the site in order to gain a better understanding of the hydrogeology-geochemistry of ground water, and to respond to questions raised by the NRC in mid-2012. DOE determined that contamination in the alluvial aquifer was exceeding the uranium standard (0.44 mg/L) at the Point of Exposure well (boundary), and that contaminated San Andres ground water extends beyond the site boundaries. NRC directed the DOE to conduct further analysis of the site including an assessment of exposure and human-health risk to off-site San Andres aquifer well users (Ref. 4).

Based on a limited sampling of wells south and east of the site, the uranium levels in private well water do not exceed the federal drinking water maximum contaminant level (MCL) of 0.030 mg/L. In 2014, DOE conducted a study to develop a revised ground water conceptual model for the site, and to determine if there is potential exposure to down gradient users of ground water from mill-related contamination (Ref. 4). The Department of Energy (DOE) completed a status report on the flow and contaminant transport from the Anaconda Bluewater Disposal Site in November 2014. The DOE's 2014 site status report indicated that uranium contamination from the Bluewater disposal cell could have migrated to the Toltec and HMC areas by 1980-1981 based on the average linear ground water velocities and flow directions in the San Andres Aquifer. The DOE's site status report also suggests that two water supply wells in the Toltec area appear to produce ground water that represents a mixture of uranium-contaminated and uncontaminated water (Ref. 4).

Homestake Mining Company Superfund Site

The HMC uranium mill opened in 1958 and is located 5.5 miles north of the Village of Milan, New Mexico. Milling operations began at Homestake mill site in 1958 and continued for approximately 30 years. The operations involved the use of an alkaline leach-caustic precipitation process to extract and concentrate uranium oxide from uranium ores. The byproducts (waste) were either disposed of above ground in the two tailings impoundments or recycled back into the milling process (Ref. 7). HMC began a state-approved ground water restoration program in 1977 under Discharge Permit No. 200 (DP-200). The program consists of a ground water collection/injection system for the San Mateo alluvial aquifer and the Upper and

Middle Chinle aquifers. The objective is to reduce contaminant concentrations to background concentrations.

In September 1983, EPA placed the HMC Superfund site on the National Priorities List (NPL), because of radon contamination in air associated (emanating from) with the tailings. Further investigations at the site identified ground water contamination in onsite monitoring wells and some nearby residential wells. HMC and the EPA signed a consent decree in December 1983. The decree required HMC to provide an alternate water supply to nearby residences and to pay for water usage for 10 years. The alternate water supply connections to residences were completed in April 1985, with HMC paying for water usage until 1995 (Ref. 8). The Record of Decision (ROD) for the HMC site does not include a remedy for ground water (Ref. 9).

Under a Memorandum of Understanding effective December 14, 1993 between the NRC and the EPA [59 FR 3740], the NRC has primary federal regulatory authority over ongoing surface reclamation and ground water remediation through administration of HMC's corrective action program (last revised in March 2012) through NRC Source Materials License SUA-1471 (last amended July 19, 2013 [amendment 47]), while the EPA has review and oversight authority over these activities. NMED regulates site activities relating to ground water abatement and closure activities under DP-200. HMC renewed DP-200 for the treatment and discharge of up to 7,920,000 gallons per day (or 5,500 gallons per minute, gpm) of contaminated fluids. The discharges are associated with ongoing ground water abatement activities for contamination originating from former uranium milling activities. Contaminants of concern associated with the discharge include nitrate, selenium, uranium, radium, chloride, sulfate, molybdenum, and total dissolved solids (Ref. 10).

In September 2005, NMED and EPA conducted a well survey in the residential subdivisions south of the mill site to verify that residents were not being exposed to contaminated well water. The agencies collected samples from 34 private water supply wells. The samples were analyzed for EPA's target analyte list of compounds and radionuclides. In November 2005, EPA Region 6 contacted the Agency for Toxic Substances and Disease Registry (ATSDR) and requested that ATSDR review the results and determine whether a public health hazard exists. Additional sampling was conducted in 2006 and 2007, and NMED issued a final report in 2007 (Ref. 11).

In 2009 ATSDR published a Health Consultation Report based on their review of the water supply well sample data. ATSDR calculated exposure doses for the contaminants above health comparison values and EPA drinking water maximum contaminant levels (MCLs) in well sample results and determined that those being used as a source of potable water were not at levels that would produce known adverse health effects. The report did identify a few wells that have uranium concentrations well above the background concentration that were not being used and recommended that they should not be used (Ref. 12).

The NMED, EPA, and the NRC collaborated to conduct well data collection and sampling activities in August and September 2005, and May and August 2006 to determine the number of residential wells in which ground water does not meet applicable federal, state, and site ground water standards. NMED conducted a SI for the Anaconda Bluewater Disposal Site in 2008 (CERCLIS ID NMD007106891) (Ref. 6) and another SI for the upper San Mateo Creek Basin in 2009 (CERCLIS ID NMN00060684) (Ref. 13).

3 Site Investigation

3.1 Source/Waste Characteristics and Description

The source(s) of contamination to ground water in the lower SMC basin includes tailings seepage from the Bluewater Disposal Site and the HMC Superfund site. Additional potential sources include the two Ambrosia Lake area mill sites (Phillips Disposal site and Rio Algom Mill site) and the former legacy uranium mine dewatering discharges in the upper SMC basin may also have contributed to ground water contamination in the lower SMC basin.

The HMC tailings piles are the closest known source of ground water contamination from the seepage and infiltration into the alluvium and upper two zones of the Chinle Formation. Beginning in the early 1960s, the mill tailings were placed on the land surface of the San Mateo Creek alluvium without an engineered liner. Contamination from the tailings seepage subsequently infiltrated into the alluvial and Chinle aquifers, moving beyond the facility property boundaries, and into the ground water that originally supplied potable water to nearby private residential and irrigation wells.

Contaminants of concern that have been identified in ground water samples from monitoring wells at the HMC Superfund site and in downgradient private supply wells include: selenium, uranium, molybdenum, sulfate, chloride, total dissolved solids (TDS), nitrate, vanadium, thorium-230, and radium-226/228. Site standards for remediation of the ground water were established in 2006 using data from 1995 to 2004, and they were incorporated into the NRC license SUA-1471 under Amendment No. 39 as Ground Water Protection Standards (Ref. 14).

Other sources of contamination that have not been well characterized include the mine dewatering discharges that occurred in the upper reaches of the SMC basin.

3.1.1 Source Waste Characterization Methods and Results

Ground water monitoring at the HMC Superfund site began in 1975 to characterize the contaminant plume, to evaluate the performance of the restoration strategies, and to demonstrate progress made in restoring ground water quality to meet site standards (Ref. 15). To date, HMC has drilled nearly 700 wells in the three main aquifer units to investigate releases from the mill and tailings area. HMC currently samples approximately 80 wells on a quarterly or semi-annual basis to meet NRC license and NMED permit requirements, and voluntarily samples several hundred additional wells to assess the performance of the restoration strategies and any changes in the ground water plumes in the alluvial aquifer and upper two units of the Chinle aquifer (Ref. 7). Annual monitoring reports are submitted to the NRC and placed on the publically available NRC Agency Wide Access and Management System (ADAMS) website at http://www.nrc.gov/reading-rm/adams.html.

4 Ground Water Pathway

The ground water pathway assesses the threat to human health and the environment by determining whether hazardous substances are likely to have been released to ground water and whether any receptors (via drinking water wells, wellhead protection areas, resources) are likely to be exposed to hazardous substances as a result of a release.

4.1 Ground Water Use

According to the New Mexico Drinking Water Bureau, Safe Drinking Water Information System (SDWIS) database, there are three active municipal water supply wells managed by the Village of Milan that serve approximately 2,000 people located in the lower SMC basin.

The New Mexico Office of the State Engineer (OSE) maintains a Water Rights Reporting System (NMWRRS) containing water rights and well information for wells in the Bluewater Basin-Milan, New Mexico area. The NMWRRS is available via the website at http://nmwrrs.ose.state.nm.us/nmwrrs/index.html. According the NMWRRS database, there are 861 permit records within the lower SMC basin. Of these, over 600 of the records are associated with ground water monitoring and operations at the HMC Superfund site.

Figure 2 shows the locations of registered public water supply and private/residential wells within the lower SMC basin. Table 1 summarizes the well usage within the lower SMC basin.

4.2 Regional Hydrogeology

Ground water in the area around the Homestake site is the result of two intersecting flow systems: 1) ground water from the upgradient Bluewater Disposal site generally flows from west to east toward the Homestake mill site; and 2) ground water from Lower San Mateo Creek flows generally down gradient to the south and east toward the Rio San Jose surface water channel (Ref. 16 and Ref. 17). Within the Site investigation area, three aquifer systems result from the two intersecting flow systems and are of concern for ground water contamination. The upper most aquifer system is the San Mateo Creek alluvial aquifer which is located within the areas of alluvial fill deposited in the erosional surfaces of the Chinle Formation. The underlying (middle) system is comprised by units of the sandstone and shales of the Chinle Formation identified as the Upper, Middle, and Lower Chinle aquifers. Beneath the Chinle Formation is the San Andres-Glorieta Sandstone Formation (lower most aquifer) which is predominantly a limestone and sandstone unit. The San Andres Limestone-Glorieta Sandstone is the primary regional aquifer used by the communities of Bluewater, Milan, and Grants for their current and long-term potable water supply. Figure 3 shows the general ground water flow directions of the alluvial aquifer and San Andres aquifer in the lower SMC basin.

Ground water elevations, gradients, hydraulic properties, and flow directions for the three aquifer units are extremely variable and complex due to natural conditions and the ongoing HMC ground water extraction, injection, and treatment systems that operate to control plume migration and restore impacted ground water to background water quality standards. Structurally, the lower Site investigation area is characterized by two normal faults (East Fault and West Fault) that generally bound the east and west sides of the San Mateo Creek alluvial channel. Bedrock formations dip gently to the east and northeast. Generally speaking, ground water in the unconfined alluvial aquifer flows southwest toward the Rio San Jose drainage and ground water in the Chinle and San Andres-Glorieta flows northeast toward the axis of the San Juan Basin. There is hydraulic communication between the alluvium and the Chinle depending on factors such as the proximity to faults, erosional contact, and recharge areas.

The Quaternary-age alluvial (Qal) aquifer has an average saturated thickness of approximately 95 feet near HMC, while in other areas the alluvial aquifer are completely unsaturated. Ground water elevations in the alluvial aquifer range from approximately 6,427 to 6,604 feet above mean sea level (MSL). North of the HMC Superfund site, the hydraulic gradient in the alluvial aquifer is approximately 0.0033 feet/feet (ft/ft). There is limited hydraulic communication between the alluvial and Chinle aquifers depending on factors such as the proximity to faults, erosional contact, and recharge areas.

The Triassic-age Chinle Formation (Trc) underlies the alluvium and reaches a maximum thickness of 850 feet in the Site investigation area. The Chinle Formation is comprised of the Upper, Middle, and Lower aquifers consisting of interbedded sandstones, siltstones, and shales that are generally low in permeability and transmissivity of ground water.

The Chinle Formation generally behaves as a low yield, semi-confined aquifer system, although some sandstone beds can produce fair to moderate amounts of water to private residential and small irrigation wells. The average thickness of the Upper Chinle aquifer is 35 feet and the general ground water flow direction is from north to south. Ground water elevations in the Upper Chinle range from 6,456 to 6,540 feet above MSL. The Middle Chinle aquifer has an average saturated thickness of 44 feet in the area around the HMC Superfund site. Ground water elevations in the Middle Chinle aquifer range from 6,438 to 6,541 feet above MSL. The Lower Chinle aquifer behaves as a confined aquifer system due to a shale aquitard although secondary permeability is developed from fractures or other physical alteration. Ground water elevations in the Lower Chinle range from 6,426 to 6,488 feet above MSL.

The Permian-age San Andres (Psa) aquifer exceeds a thickness of 200 feet in the lower SMC basin. The hydraulic gradient is approximately 0.00086 ft/ft and ground water elevations range from 6,420 to 6,433 feet above MSL. The San Andres Limestone yields high volumes of ground water to a well because of the dissolution along fractures and karst nature of the limestone. The San Andres Limestone is the primary regional aquifer used by the communities of Bluewater, Milan, and Grants for their potable water supply.

4.3 Local Ground Water Quality

Contaminant releases to the alluvial aquifer are indicated by the presence of elevated concentrations of selenium, uranium, molybdenum, sulfate, chloride, total dissolved solids (TDS), nitrate, vanadium, thorium-230, and radium-226/228. Contamination of the alluvial and Chinle aquifers from mill tailings seepage at the HMC mill site was first detected in the 1960s-1970s. Subsequently, several of the nearby residential wells producing water from the alluvial and Chinle aquifers for domestic, agriculture, and livestock usage became contaminated with HMC mill tailings seepage water.

Private well owners whose water quality has been compromised by ground water contaminants were provided with an alternative potable water supply connection to the Village of Milan municipal water supply system which produces water from the San Andres aquifer.

HMC began monitoring of the near upgradient alluvial aquifer background water quality in 1976 and the far up-gradient alluvial background water quality in 1994. The major cation in alluvial background water is sodium and the major anion is sulfate. The background alluvial water quality is considered to be “brackish” with TDS concentrations greater than 1,000 mg/L.

In the lower SMC basin area, the Upper Chinle aquifer is characterized by sodium as the major cation, and either bicarbonate or sulfate as the major anion depending on the location. The Upper Chinle aquifer water quality is similar to the alluvial aquifer water quality where the two units are in hydraulic communication within sub-crop areas. The area where the Upper Chinle and alluvial aquifers are in hydraulic communication has resulted in a “mixing zone” between the two aquifers. The Middle Chinle aquifer also has a mixing zone where alluvial aquifer water has been impacted in sub-crop areas where mill tailings seepage has migrated and mixed with the Middle Chinle ground water. The natural water composition of the Lower Chinle aquifer is variable and reflects the limited permeability and lower transmissivity of the shale in this unit.

Based on water sample laboratory results from the NMED Bluewater SI in 2008, ground water from the San Andres-Glorieta Aquifer is typically a calcium-sulfate/bicarbonate type of water, and sodium concentrations are lower relative to calcium concentrations. The San Andres aquifer is not known to be contaminated with mill tailings seepage from the HMC Superfund site, but may be contaminated with mill tailings seepage from the Bluewater Disposal site. The down-gradient extent of the contaminant plume at the Bluewater Disposal site is known to be at or beyond the southern and eastern property boundaries of the Bluewater Disposal site. The DOE is currently sampling onsite monitoring wells on a semi-annual basis and nearby off-site private wells as appropriate.

4.4 Non-Sampling Data Acquisition

NMED conducted a survey of water use at private well locations as part of the process included in this SR. An initial list of private well locations and well owner contact information for proposed sampling under this SR was provided to NMED in early 2014 from the EPA. Additional wells were added to the list as information became available. NMED mailed 41 water use survey forms to private well owners in June 2014. The water use forms were used to establish information on the existence, current operational status and use of the wells. Based on the results of the survey a number of residents continue to use their wells for non-drinking purposes including bathing, washing vehicles, livestock watering, and seasonal gardening. NMED followed up the survey by mailing out access forms to allow NMED access to collect samples from the wells.

Based on the well survey and access agreements received, 58 wells/sampling locations were originally proposed in the SI work plan (Ref. 18) and 23 wells were actually sampled in October 2014. Other wells were either inaccessible or inoperative. Three additional wells (LSM-60, LSM-61, and LSM-62) were sampled in January 2015.

4.5 Sampling Activities

In accordance with the SI work plan dated September 2014, NMED sampled ground water from private residential and public water supply wells that were completed in three primary aquifers (alluvial, Chinle Formation, and San Andres) to assess ground water quality across the Site. Table 2 summarizes the laboratory analyses for general chemistry, total and dissolved metals, and radiochemistry. Figure 4 shows the ground water sampling locations Site-wide and their subdivision into upper, middle, and lower investigation areas.

In general, ground water samples from private wells and municipal water supply wells were collected at the in-line valves/spigots between the wellhead and treatment/purification systems;

otherwise, at wells with no purification system, samples were collected directly from the nearest spigot to the well. Private supply wells were purged a minimum of 15 minutes to ensure stagnant water within the discharge pipeline and pressure tank was purged prior to sampling.

Well locations without a dedicated pump were sampled using a portable submersible pump. One ground water sample (LSM-41) was collected from an irrigation well (B-5) that was in the process of plugging and abandonment by a local drilling contractor. Sample LSM-41 was collected from a portable submersible pump supplied by the drilling contractor.

Prior to sampling, wells were purged for at least 15 minutes or until field water quality parameters including pH, conductivity, and temperature which were monitored during purging, had stabilized (+/- 0.10 for pH, +/- 3% µS/cm for conductivity and +/- 1 degree C for temperature) and ground water samples were collected. Field parameters were measured using a Yellow Springs Instruments (YSI) Model 556 multi-probe instrument for pH, conductivity, dissolved oxygen, and temperature. A separate turbidity meter was used to record turbidity measurements. The water quality meters were checked and calibrated prior to sampling in accordance with the manufacturer's instructions.

All samples collected in this program utilized chain-of-custody handling and documentation procedures according to the NMED-GWQB Quality Management Plan (QMP) and NMED-SOS Quality Assurance Project Plan (QAPP) dated March 2014 (Ref. 19 and Ref. 20), and the SI work plan dated September 2014 (Ref. 18). Samples were collected in the appropriate containers with preservatives, placed in insulated coolers with ice, and shipped to the laboratories within the specified analytical holding times. All samples were screened with a Ludlum Model 14C Survey Meter (rate meter) and a Ludlum Model 44-9 alpha, beta, gamma detector using at least a 60 second count on the surface of the sample container prior to packaging and shipment to the laboratory.

4.6 Analytical Results

Twenty-eight ground water samples (including two field duplicates) were analyzed by EPA-certified laboratories. Table 3 summarizes the ground water investigation results and compares these results to the EPA MCLs and NMWQCC ground water standards.

4.6.1 General Chemistry

Analytical results were reported for 18 general chemistry parameters, including anions such as, chloride (Cl), carbonate (CO3), bicarbonate (HCO3), and sulfate (SO4); and cations such as, dissolved calcium (Ca-diss), dissolved sodium (Na-diss), dissolved potassium (K-diss), and dissolved magnesium (Mg-diss). Trilinear/radial diagrams and stiff diagrams were used to evaluate major ion associations and characterize the sample water-types and spatial changes in general water chemistry across the Site.

Figures 5 through 11present data summary tables, radial diagrams, and stiff diagrams that illustrate the spatial variation in general water chemistry across the Site, as divided into the upper, middle, and lower basin areas, respectively (see Figure 4).

Based on the general chemistry results (summarized in Table 3), parameters that were contaminants of concern detected in the samples analyzed are chloride, nitrite and nitrate (NO2+NO3), sulfate (SO4), and total dissolved solids (TDS). Nitrate and nitrite concentrations (detected) range from 0.58 mg/L to 17.2 mg/L, with the maximum concentration detected in sample LSM-56, collected from an alluvial well located in the upper basin area (see Figure 5). Sulfate concentrations range from 80 mg/L to 2,380 mg/L, with the maximum concentration detected in sample LSM-56, in the upper basin area (see Figure 5). TDS concentrations range from 322 mg/L to 3,930 mg/L, with the maximum concentration detected in sample LSM-52, collected from an alluvial well located south of the HMC Superfund site in the lower basin area (see Figures 9 and 10). Twenty-seven of 28 samples exceed either the EPA MCLs and/or NMWQCC ground water standards for one or more of these general chemistry parameters.

Chloride was detected in three samples (LSM-7, LSM-52, and LSM-60 at concentrations of 476 mg/L, 567 mg/L, and 444 mg/L, respectively), that exceed the NMWQCC standard (250 mg/L). Sample LSM-7 was collected from a San Andres aquifer well located in the middle basin area of the Site (see Figure 7). Samples LSM-52 (Qal) and LSM-60 (Trc) were collected from wells located south of the HMC Superfund site in the lower basin area (see Figures 9 and 10).

In general, sulfate and TDS concentrations are greater in samples collected from the alluvial wells across the Site. The major cation in the alluvial ground water is sodium and the major anion is sulfate as illustrated by the stiff diagrams (see Figures 8 and 11). Dissolved calcium is another cation that was detected at elevated concentrations (478 to 510 mg/L) in samples LSM-56 and LSM-62, from alluvial wells located in the upper basin area (see Figure 6).

In the lower basin area, the general chemistry of the Upper Chinle aquifer is characterized by sodium as the major cation, and either bicarbonate or sulfate as the major anion depending on the location (see Figure 11). The Upper Chinle aquifer (Trc) water quality is similar to the alluvial aquifer (Qal) water quality where the two units are hydraulically connected in sub-crop areas.

Across the Site, the general chemistry of the San Andres aquifer is typically a sodium and bicarbonate-type of ground water, with higher dissolved calcium and sulfate concentrations relative to sodium and bicarbonate concentrations in samples collected from up-gradient wells located in the southwestern extent of the lower basin area (see Figure 11).

4.6.2 Radiochemistry

Analytical results were reported for 16 radiological parameters, including uranium isotopes such as, uranium-234 (U-234) and uranium-238 (U-238); and gross alpha with natural uranium (U-nat) reference. Trilinear/radial diagrams and stiff diagrams were used to evaluate the relative proportions of U-234 to U-238, and gross alpha (U-nat) concentrations across the Site.

Figures 12 through 15 present data summary tables and radial diagrams that illustrate the spatial variation in radiochemistry across the Site, as divided into the upper, middle, and lower basin areas, respectively (see Figure 4).

Based on the radiochemistry results (summarized in Table 3), U-238 was detected at concentrations that range from 0.27 pCi/L to 60.2 pCi/L. Eleven of 28 samples exceed the EPA MCL (10 picocuries per liter (pCi/L) for U-238. U-234 was detected at concentrations that range from 2.1 pCi/L to 75.2 pCi/L; however, neither EPA MCLs and/or NMWQCC ground water standards have been established for U-234. Gross alpha (U-nat) was detected at concentrations that range from 3.6 pCi/L to 116.9 pCi/L. Fourteen of 28 samples exceed the EPA MCL (10 pCi/L) for gross alpha (U-nat). Although radium-226 was identified as a human-health risk under the soil exposure pathway (Section 6.1), it was not detected at concentrations above the EPA MCL (5 pCi/L) in the 28 ground water samples analyzed.

Maximum concentrations of U-238, U-234, and gross alpha (U-nat) were detected in samples LSM-34 and LSM-52 collected from alluvial wells located in the middle and lower basin areas (see Figures 13 and 14). U-238 was detected at concentrations of 60.2 pCi/L and 58.2 pCi/L, respectively. U-234 was detected was detected at concentrations of 75.2 pCi/L and 69.5 pCi/L, respectively. Gross alpha (U-nat) was detected at concentrations of 116.9 pCi/L and 108.2 pCi/L, respectively.

Uranium mass (U-mass) was detected at concentrations that range from 4 micrograms per liter (µg/L) to 210 µg/L. Twelve of 28 samples exceed the EPA MCL (30 µg/L) for U-mass. Maximum U-mass concentrations were detected in samples LSM-34 and LSM-52 (210 µg/L and 200 µg/L, respectively) collected from alluvial wells located in the middle and lower basin areas (see Figures 13 and 14).

In general, uranium and gross alpha (U-nat) concentrations are greatest in seven samples (LSM-32, LSM-49, LSM-50, LSM-51, LSM-52, LSM-53, and LSM-60) collected from alluvial and Chinle aquifer wells located hydraulically down-gradient of the HMC Superfund site in the lower basin area, which is likely the result of contaminant releases associated with seepage from the large tailings pile onsite. The Upper Chinle aquifer (Trc) radiochemistry is similar to the alluvial aquifer (Qal) where the two units are hydraulically connected in sub-crop areas.

The elevated radionuclide concentrations detected in samples LSM-34 (Qal) and LSM-36 (Trc) in the middle basin area, in addition to, samples LSM-58 (Jmw) and LSM-61 (Jmw) in the upper basin area, may be the result of impacts by up-gradient source(s) of contamination to ground water such as the former Ambrosia Lake area mill sites (United Nuclear Corporation-Phillips Disposal site and Rio Algom Mill site), and former uranium mine dewatering discharges in the upper SMC basin.

4.6.3 Total and Dissolved Metals

Analytical results were reported for 26 total metals and 26 dissolved metals, however, only arsenic, selenium, and uranium exceed MCLs or NMWQCC standards and are discussed in this report. Analytical results for total metals were compared to the EPA MCLs and dissolved metals were compared to the NMWQCC standards. Figures 16 through 18 present data summary tables that illustrate the spatial variation for arsenic, selenium, and uranium across the Site, as divided into the upper, middle, and lower basin areas, respectively (see Figure 4).

Based on the total and dissolved metals results (see Table 3), total and dissolved uranium were detected at concentrations that range from 0.006 mg/L to 0.24 mg/L. Twelve of 28 samples exceed both the EPA MCL and/or NMWQCC ground water standard for total uranium (0.03 mg/L) and dissolved uranium (0.03 mg/L). Total and dissolved uranium concentrations are greatest in seven samples (LSM-32, LSM-49, LSM-50, LSM-51, LSM-52, LSM-53, and LSM-60) collected from alluvial and Chinle aquifer wells located hydraulically down-gradient of the HMC Superfund site in the lower basin area, which is likely the result of contaminant releases associated with seepage from the large tailings pile onsite. The Upper Chinle aquifer (Trc) radiochemistry is similar to the alluvial aquifer (Qal) where the two units are hydraulically connected in sub-crop areas. The maximum concentrations of total and dissolved uranium were detected in samples LSM-34 and LSM-52 (0.24 mg/L and 0.228 mg/L, respectively) collected from alluvial wells located in the middle and lower basin areas (see Figures 17 and 18).

Selenium concentrations ranged from 0.004 mg/L to 0.658 mg/L. with 3 samples (LSM-34, LSM-52, and LSM-61) exceeding both the EPA MCL and NMWQCC ground water standard for total selenium (0.05 mg/L) and dissolved selenium (0.05 mg/L). The maximum concentrations of total and dissolved selenium were detected in samples LSM-34 and LSM-52 (0.658 mg/L and 0.252 mg/L, respectively).

Arsenic concentrations range from 0.0021 mg/L to 0.0349 mg/L with 3 samples (LSM-34, LSM-36, and LSM-52) exceeding the EPA MCL for total arsenic (0.01 mg/L). The maximum concentrations of total arsenic were detected in samples LSM-34 and LSM-52 (0.0349 mg/L and 0.0161 mg/L, respectively) collected from alluvial wells located in the middle and lower basin areas (see Figures 17 and 18).

4.6.4 Comparison to Historical Data

Analytical results for general chemistry, radiochemistry, and metals for three ground water samples (LSM-34, LSM-35, and LSM-61) were compared to the historical data for three samples (SMC-13, SMC-10, and SMC-20) collected from the same wells during the SMC SI in 2009 (Ref. 13). Table 4 provides a comparison of the contaminants detected in these ground water samples.

The analytical results for general chemistry parameters (nitrate/nitrite, sulfate, and TDS), uranium isotopes (U-234 and U-238), and total and dissolved metals (selenium and uranium) for two of the three sample pairs (SMC-13/LSM-34 and SMC-20/LSM-61) are very similar, especially considering the five-year span between sampling events. However, the results for the third sample pair (SMC-10/LSM-35) were very dissimilar for the same parameters, which suggests that that these sample/well locations are different.

5 Surface Water Pathway

The surface water pathway assesses the threat to human health and the environment by determining whether hazardous substances are likely to have been released to surface water; and whether any receptors (via intakes supplying drinking water, fisheries, sensitive environments) are likely to be exposed to a hazardous substance as a result of a release.

5.1 Surface Water Investigation

No data acquisition was performed for the evaluation of the surface water pathway. Furthermore, the surface water pathway was not evaluated under EPA’s human health risk assessment (HHRA) completed in December 2014 (Ref. 21).

6 Soil Exposure Pathway

The soil exposure pathway assesses the threat to human health and the environment by direct contact with hazardous substances and areas of suspected contamination. This pathway addresses any material containing hazardous substances that is on or within 2 feet of the surface and not capped by an impermeable cover.

6.1 Soil Exposure Investigation

No data acquisition was performed for the evaluation of the soil exposure pathway. However, EPA's HHRA evaluated the soil exposure pathway using a residential scenario (for individuals living in the five subdivisions south of HMC) that assumes exposure to soil through the incidental soil ingestion route, external exposure to gamma radiation, inhalation of radionuclides in airborne particulates, and ingestion of produce (vegetables and fruits) modeled through the uptake of radionuclides in soil into plants. The risk was primarily due to external exposure to radium-226+D (Ra-226 plus daughter products) where the site-related life-time excess cancer risk was estimated at 6.0×10^{-5} (Ref. 21).

7 Air Pathway

The air pathway assesses the threat to human health and the environment by determining whether hazardous substances are likely to have been released to the air; and whether any receptors (human population and sensitive environments) are likely to be exposed to hazardous substances as a result of a release.

7.1 Air Quality Investigation

No data acquisition was performed for the evaluation of the air pathway. However, EPA's HHRA evaluated the air pathway using a residential scenario (for individuals living in the five subdivisions south of HMC) that assumes exposure to contaminants in air through the inhalation and submersion routes of intake. The risk was primarily due to inhalation of radon-222+D (Rn-222 plus daughter products) in ambient air where the site-related life-time excess cancer risk was estimated at 5.0×10^{-4} (Ref. 21).

8 Summary and Conclusions

Potential source(s) of contamination to ground water in the lower SMC basin include tailings seepage from the Bluewater Disposal Site and the HMC Superfund site. Other potential sources include the two Ambrosia Lake area mill sites (Phillips Disposal site and Rio Algom Mill site) as well as former legacy uranium mine dewatering discharges in the upper SMC basin that may also have contributed to ground water contamination in the lower SMC basin.

The HMC large tailings pile is the closest known source of ground water contamination due to seepage and infiltration of mill tailings liquids into the alluvium and upper two zones of the Chinle Formation. Contaminants of concern that have been identified in ground water samples from monitoring wells at the HMC Superfund site and in down-gradient private supply wells include: selenium, uranium, molybdenum, sulfate, chloride, TDS, nitrate, vanadium, thorium-230, and radium-226/228.

In general, uranium and gross alpha concentrations are greatest in samples collected from alluvial and Chinle aquifer wells located hydraulically down-gradient of the HMC Superfund site in the lower basin area, which is likely the result of contaminant releases associated with seepage from the large tailings pile onsite. The Upper Chinle aquifer radiochemistry is similar to the alluvial aquifer where the two units are hydraulically connected in sub-crop areas. A total of 7 wells in the lower basin below the HMC had elevated radiological and uranium concentrations.

Elevated radionuclide concentrations detected in alluvial aquifer in the middle and upper basin areas, may be the result of impacts by up-gradient source(s) of contamination to ground water such as the former Ambrosia Lake area mill sites and former legacy uranium mine dewatering discharges in the upper SMC basin. A total of 4 wells had elevated radiological and uranium concentrations.

In the lower SMC basin area, private well owners whose water quality has been compromised by ground water contaminants were provided with an alternative potable water supply connection to the Village of Milan municipal water supply system which produces water from the San Andres aquifer. In the upper and middle SMC basin areas, private well owners whose water quality exceeds the federal drinking water MCLs are located in rural areas of the SMC basin where public water supply connections are not available. Point-of-use water treatment systems (i.e. reverse osmosis) would be an alternative to a public water supply connection to insure the protection of human health for these residents.

9 List of References

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Figures

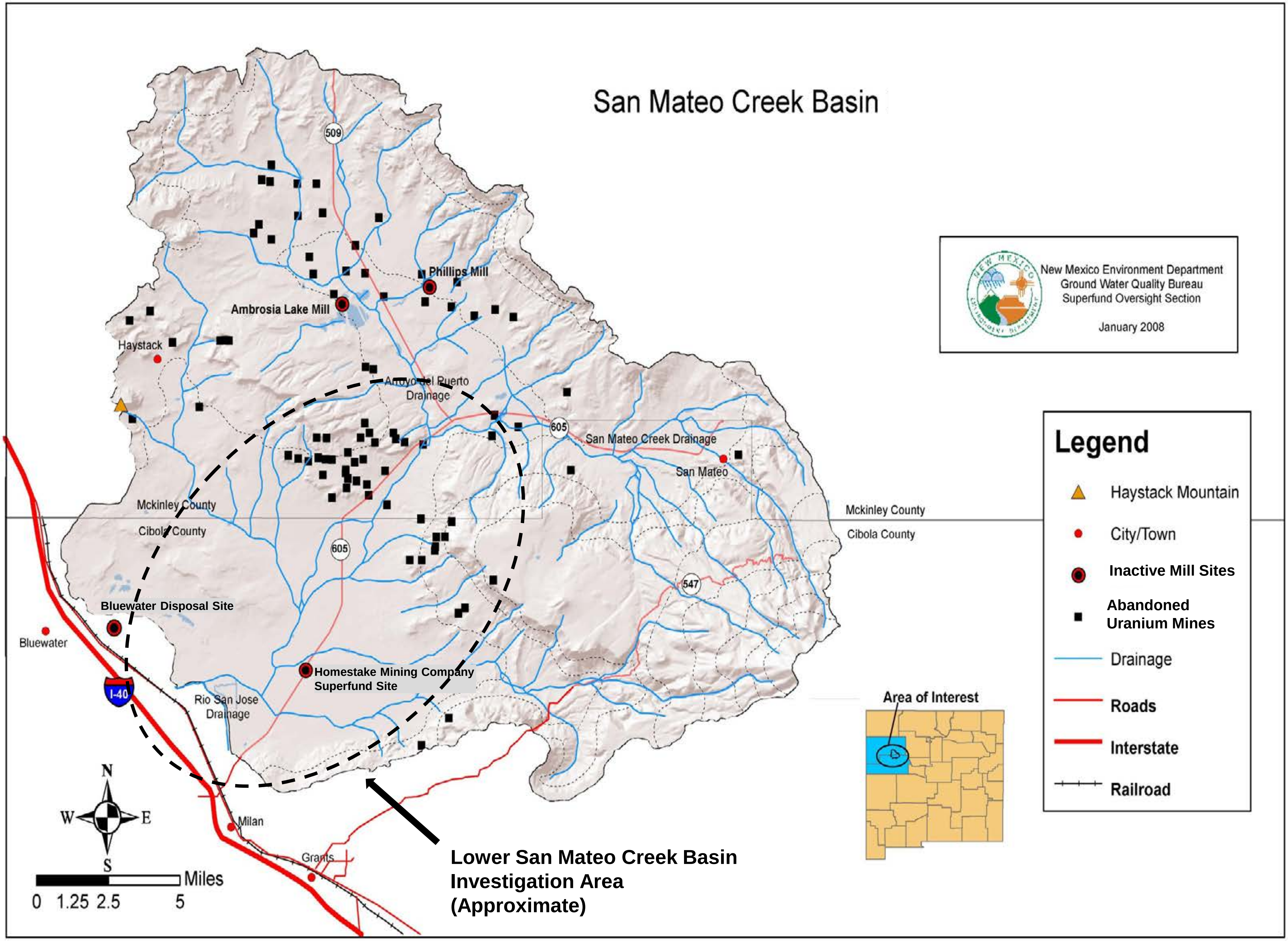


Figure 1: Site Reassessment Investigation Area in the San Mateo Creek Basin

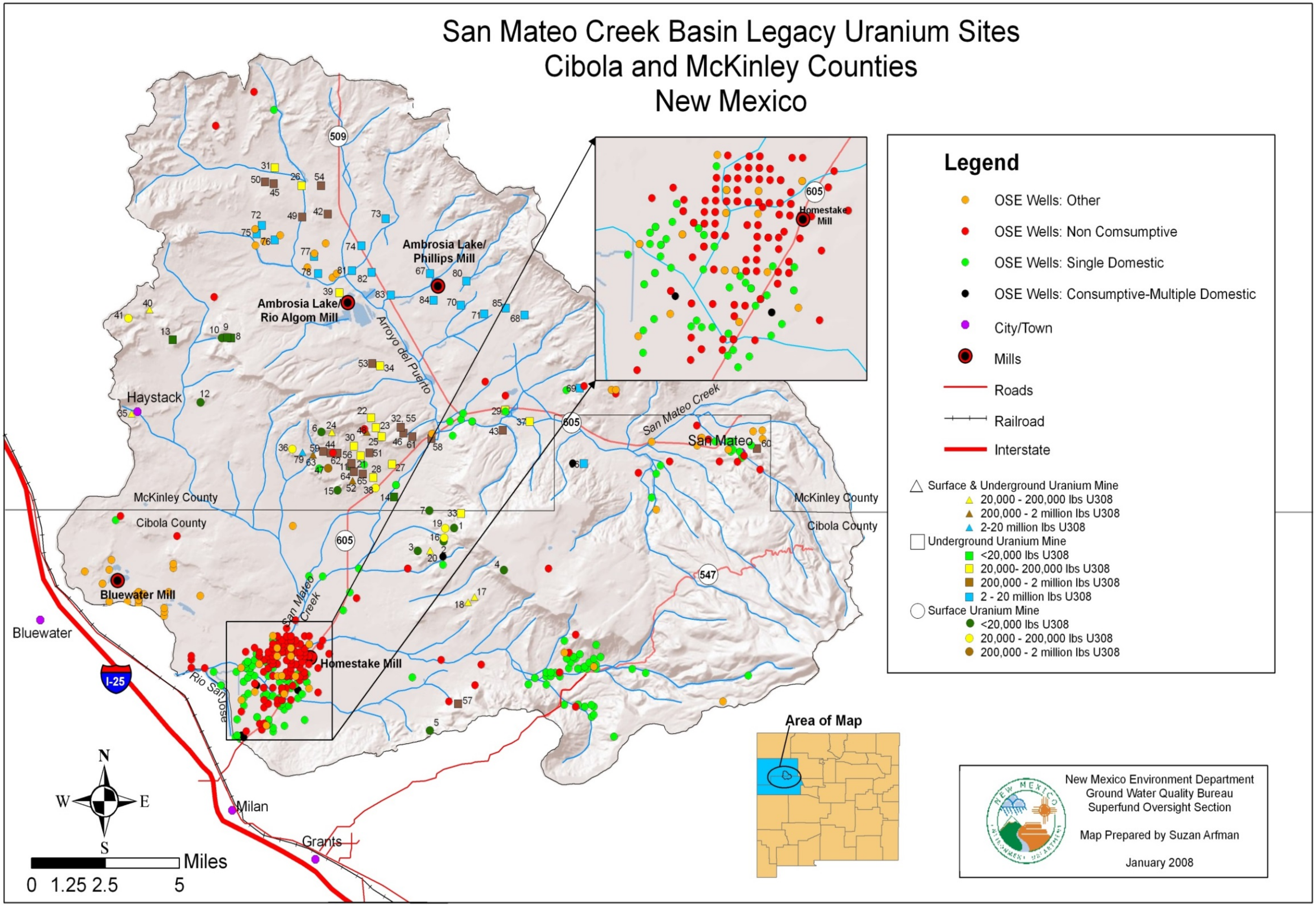


Figure 2: Registered Wells in the San Mateo Creek Basin

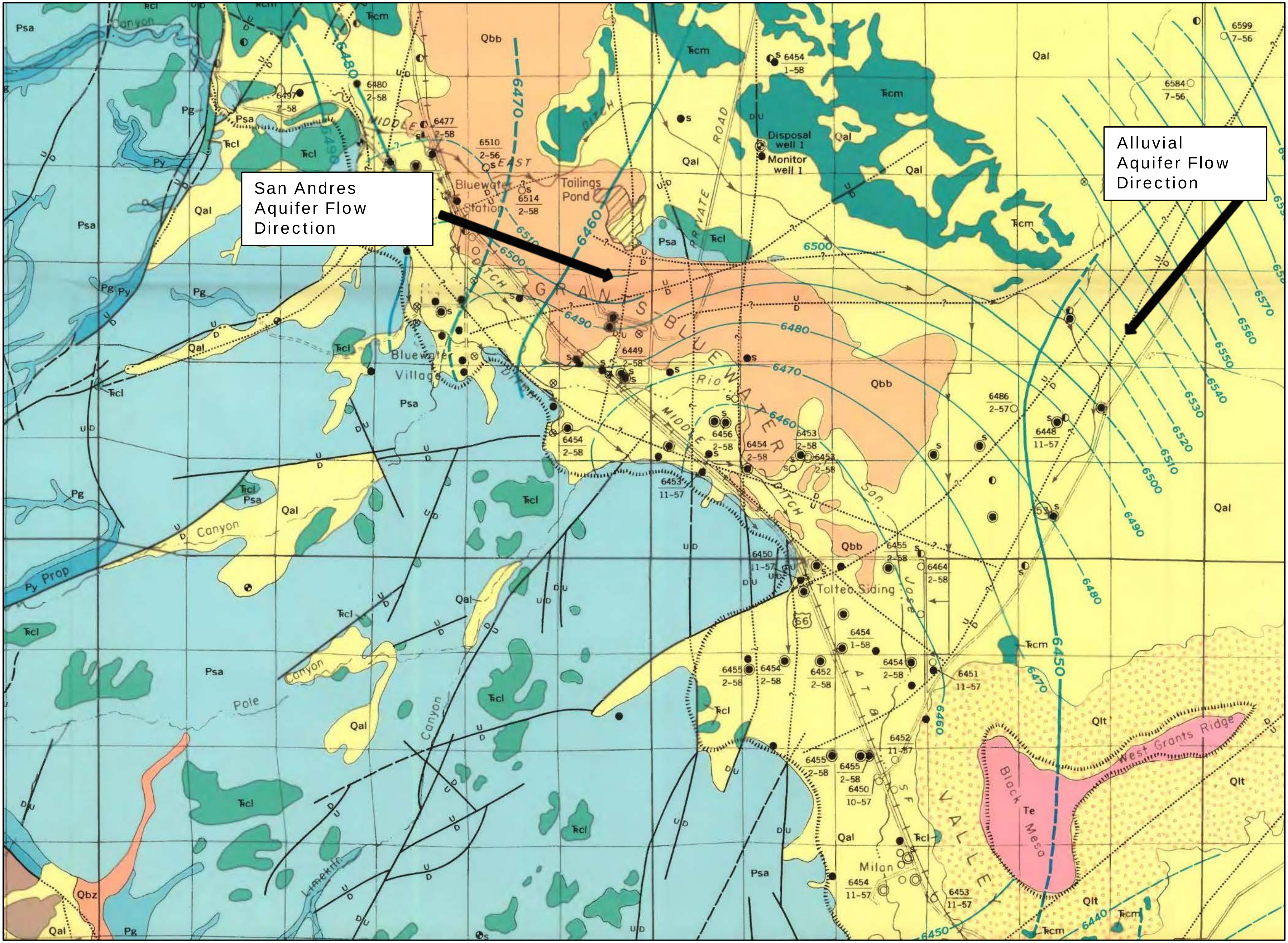


Figure 3: Hydrogeology of the Lower San Mateo Creek Basin (Ref. 5)

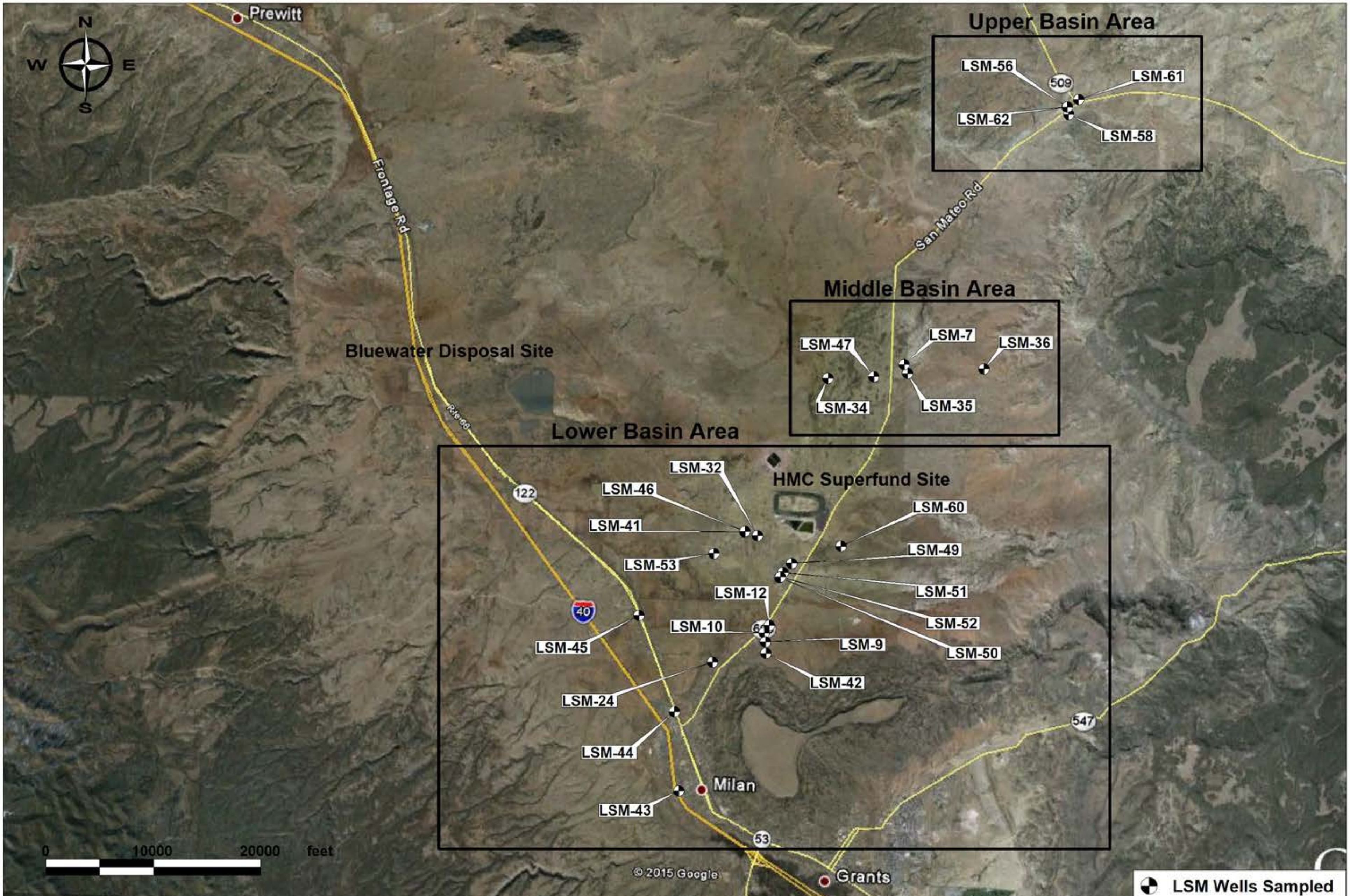


Figure 4

Ground Water Sampling Locations - Sitewide

Lower San Mateo (LSM) Creek Basin Wells Sampled: 2014-2015

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

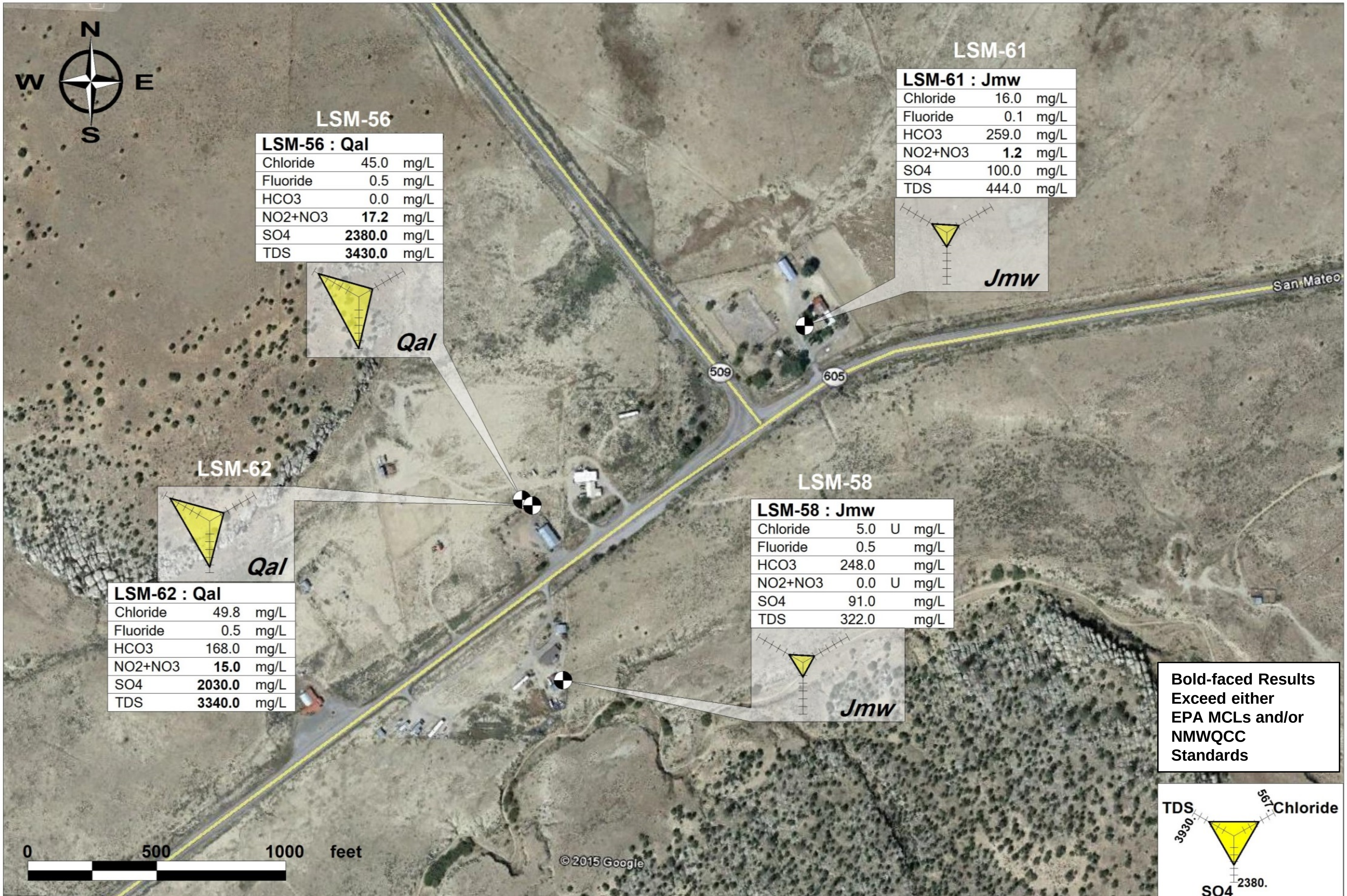


Figure 5

General Chemistry Results - Data Tables & Radial Diagrams

Alluvial & Morrison/Westwater Aquifer Wells - Upper Basin Area

New Mexico Environment Department

Lower San Mateo Creek Site Reassessment

Cibola & McKinley Counties, New Mexico

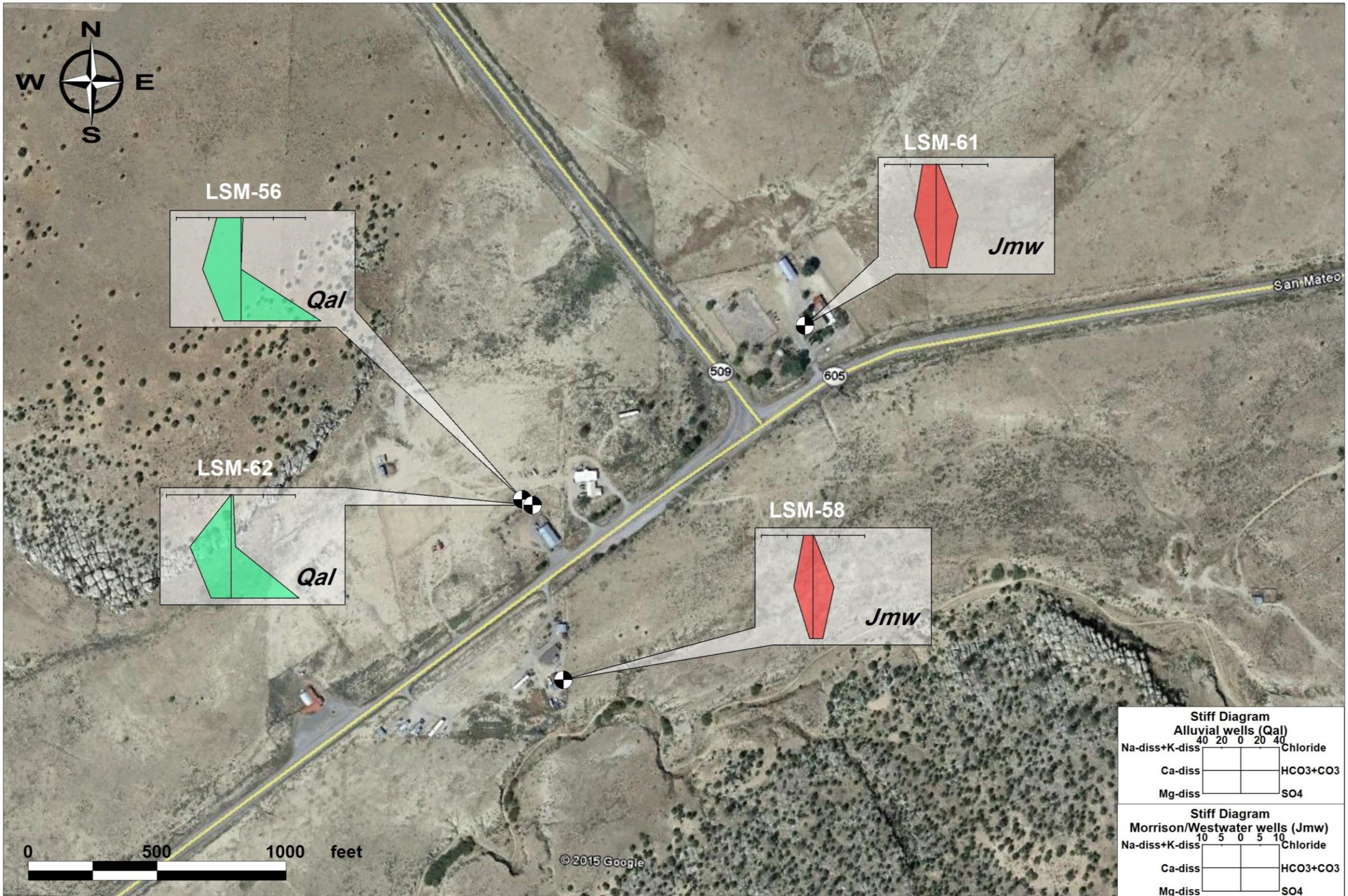


Figure 6
General Chemistry Results - Stiff Diagrams
Alluvial & Morrison/Westwater Aquifer Wells - Upper Basin Area

New Mexico Environment Department
Lower San Mateo Creek Site Reassessment
Cibola & McKinley Counties, New Mexico

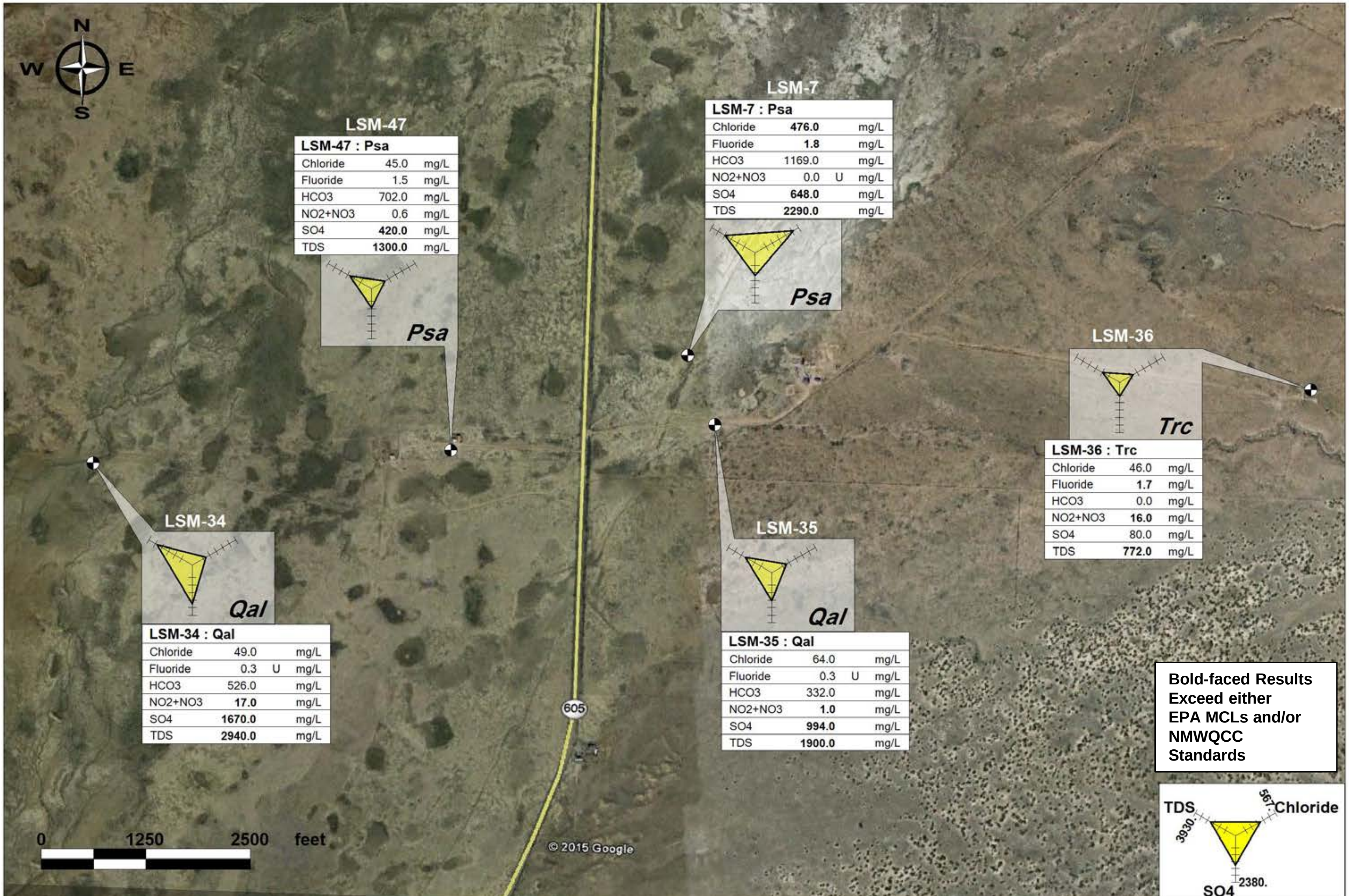


Figure 7

General Chemistry Results - Data Tables & Radial Diagrams

Alluvial, Chinle, & San Andres Aquifer Wells - Middle Basin Area

New Mexico Environment Department
Lower San Mateo Creek Basin Site Reassessment
Cibola and McKinley Counties, New Mexico

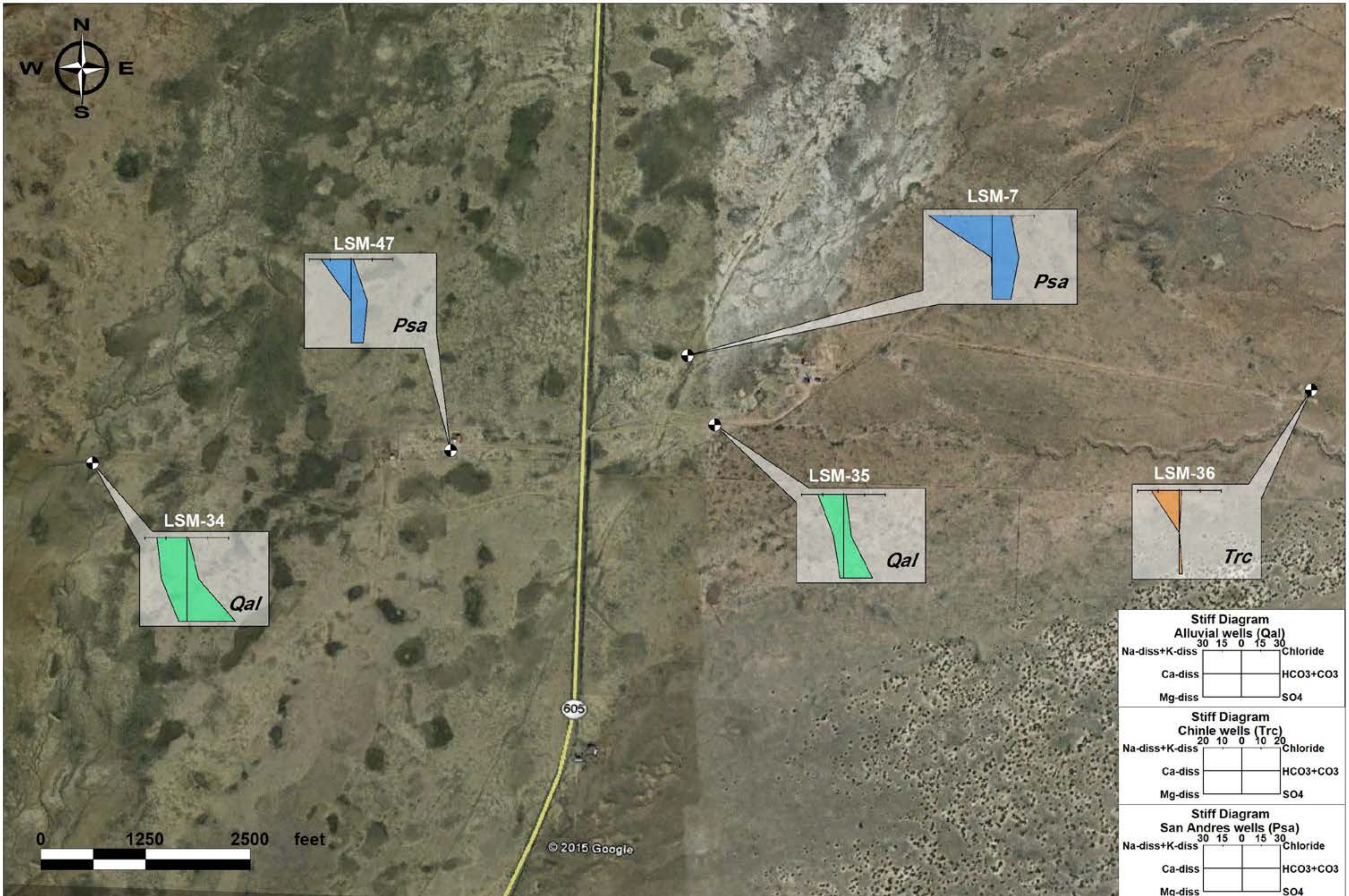


Figure 8

General Chemistry Results - Stiff Diagrams

Alluvial, Chinle, & San Andres Aquifer Wells - Middle Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

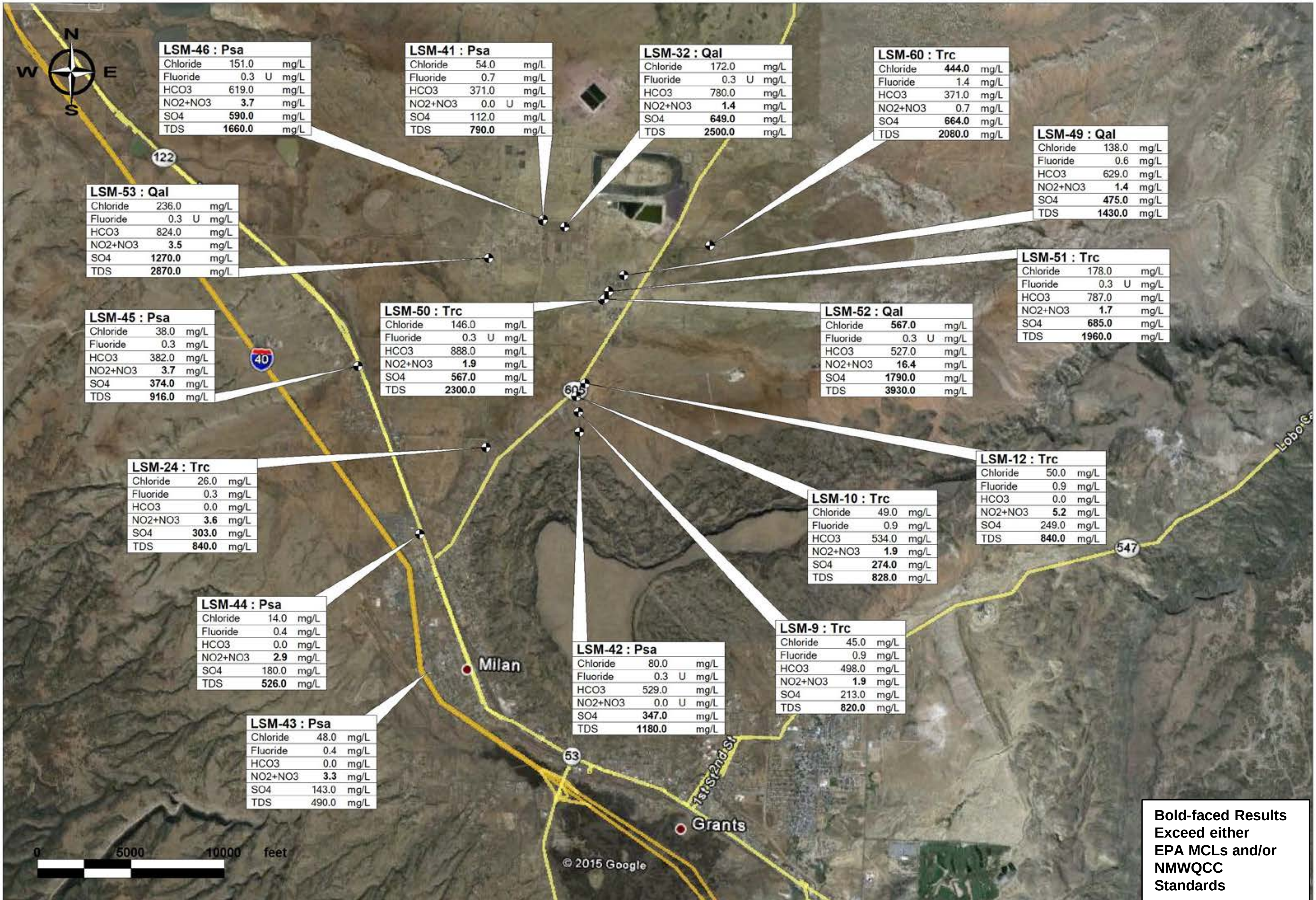


Figure 9

General Chemistry Results - Data Tables

Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

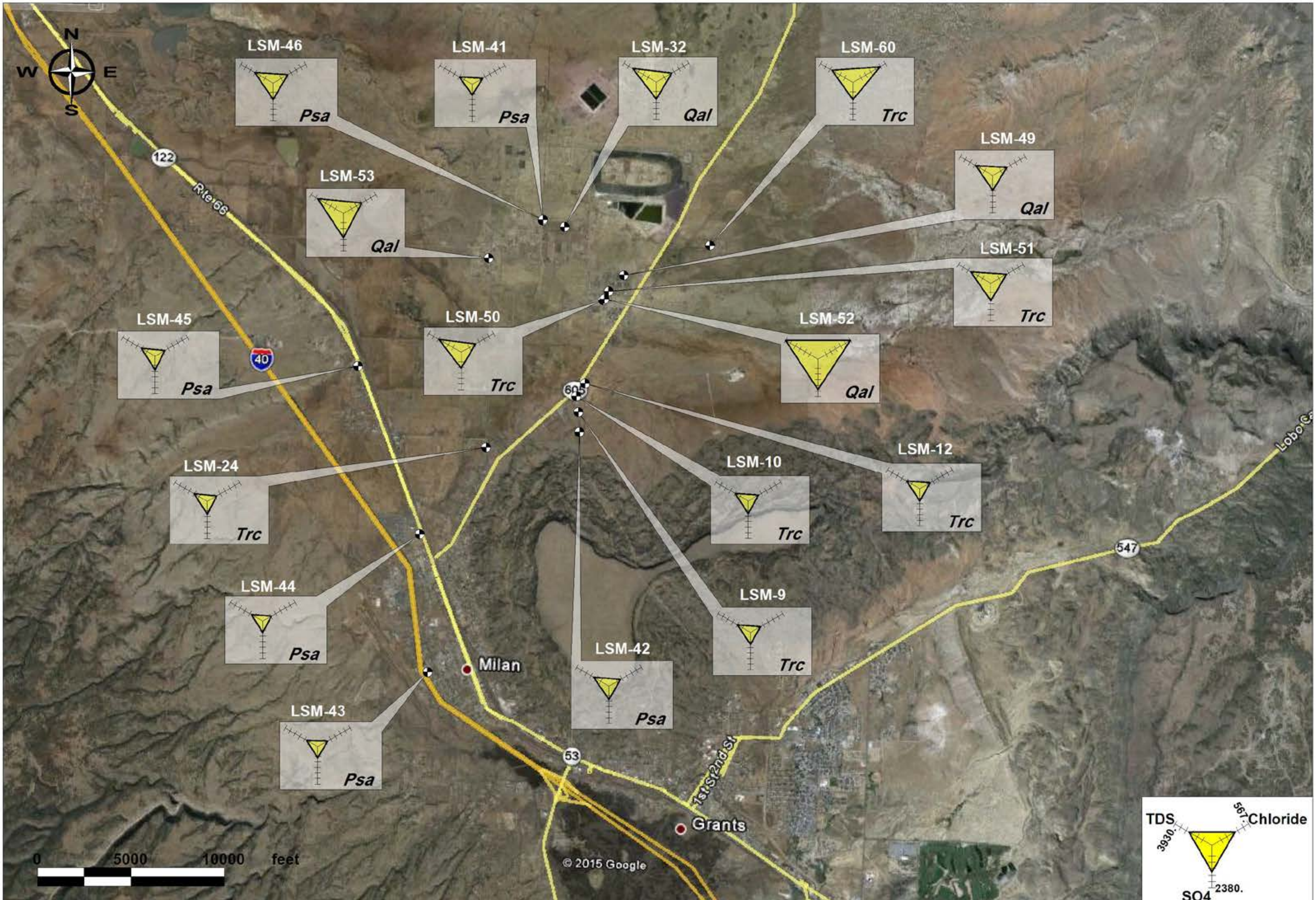


Figure 10
General Chemistry Results - Radial Diagrams
Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department
Lower San Mateo Creek Basin Site Reassessment
Cibola and McKinley Counties, New Mexico

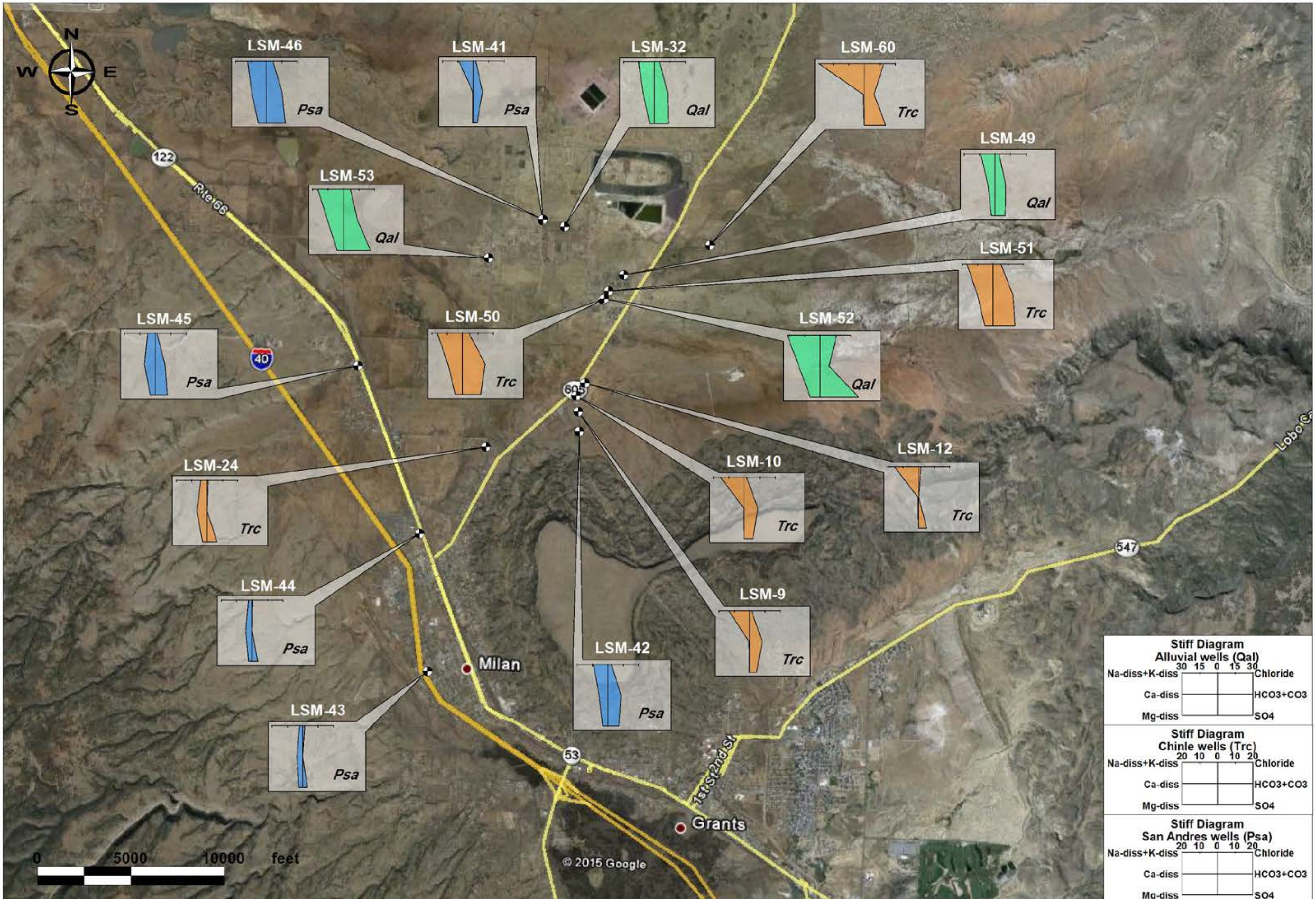


Figure 11

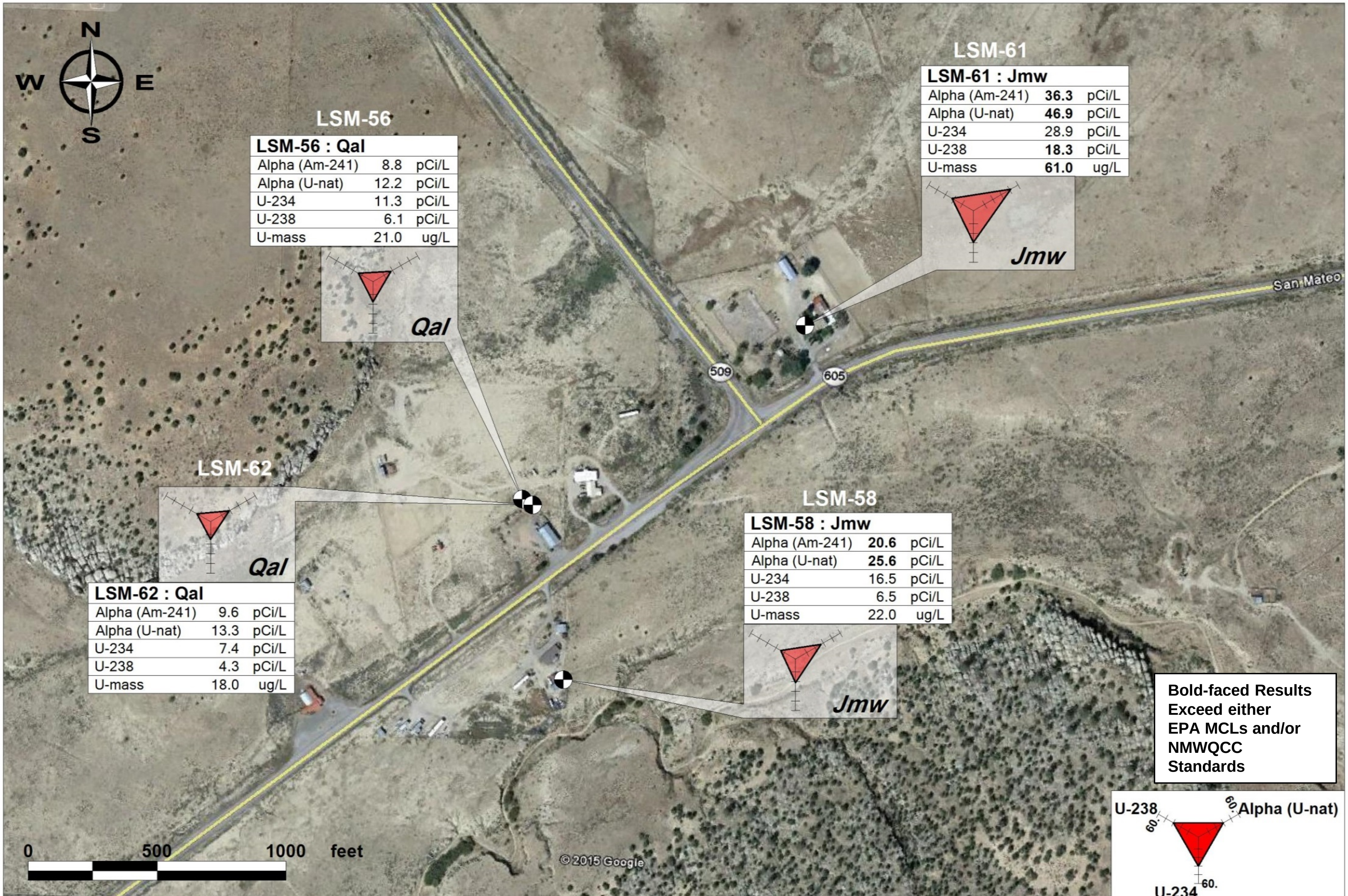
General Chemistry Results - Stiff Diagrams

Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico



LSM-56 : Qal		
Alpha (Am-241)	8.8	pCi/L
Alpha (U-nat)	12.2	pCi/L
U-234	11.3	pCi/L
U-238	6.1	pCi/L
U-mass	21.0	ug/L

LSM-61 : Jmw		
Alpha (Am-241)	**36.3**	pCi/L
Alpha (U-nat)	**46.9**	pCi/L
U-234	28.9	pCi/L
U-238	**18.3**	pCi/L
U-mass	**61.0**	ug/L

LSM-62 : Qal		
Alpha (Am-241)	9.6	pCi/L
Alpha (U-nat)	13.3	pCi/L
U-234	7.4	pCi/L
U-238	4.3	pCi/L
U-mass	18.0	ug/L

LSM-58 : Jmw		
Alpha (Am-241)	**20.6**	pCi/L
Alpha (U-nat)	**25.6**	pCi/L
U-234	16.5	pCi/L
U-238	6.5	pCi/L
U-mass	22.0	ug/L

Figure 12

Radiochemistry Results - Data Tables & Radial Diagrams

Alluvial & Morrison/Westwater Aquifer Wells - Upper Basin Area

New Mexico Environment Department

Lower San Mateo Creek Site Reassessment

Cibola & McKinley Counties, New Mexico

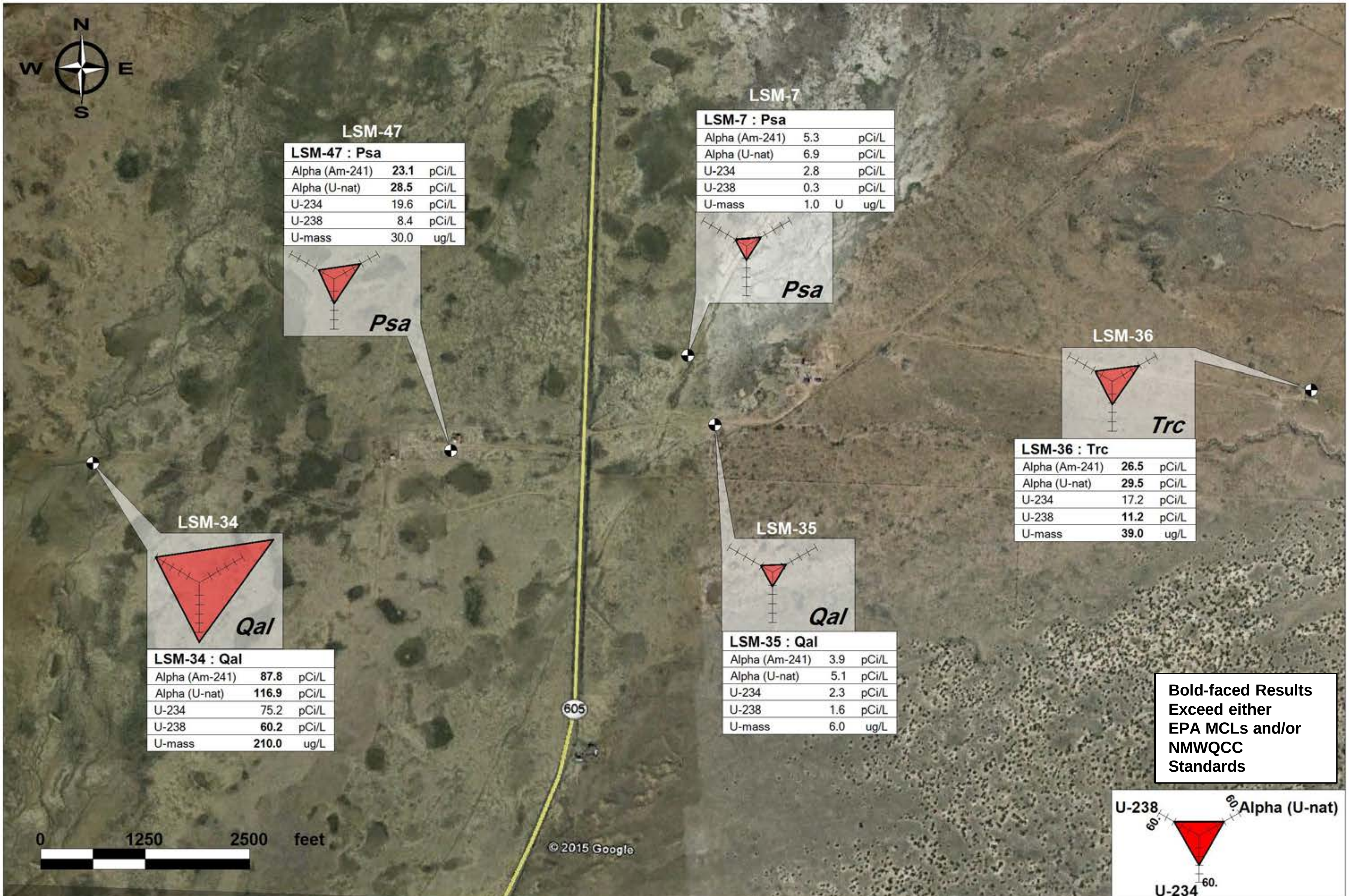


Figure 13

Radiochemistry Results - Data Tables & Radial Diagrams

Alluvial, Chinle, & San Andres Aquifer Wells - Middle Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

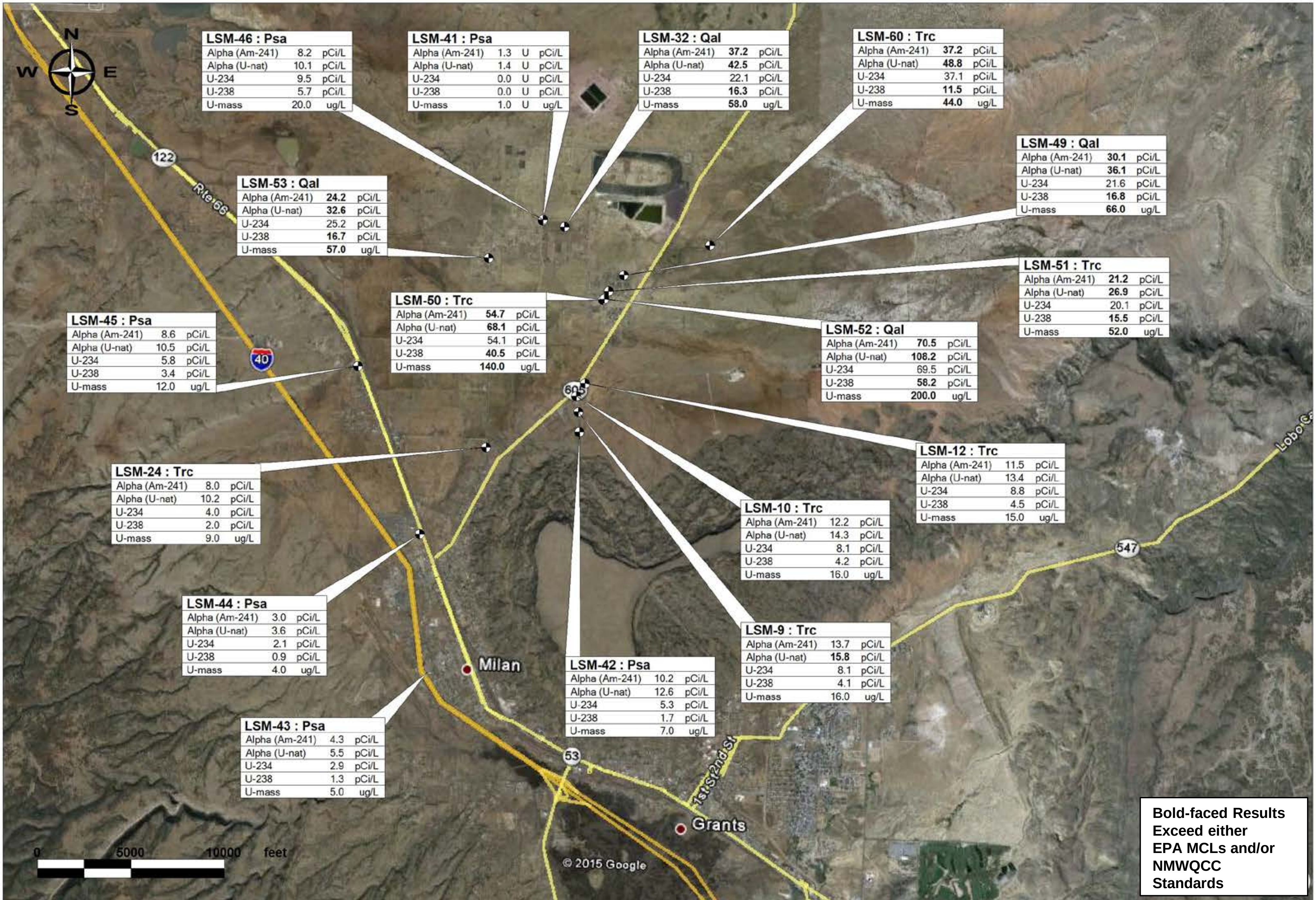


Figure 14

Radiochemistry Results - Data Tables

Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

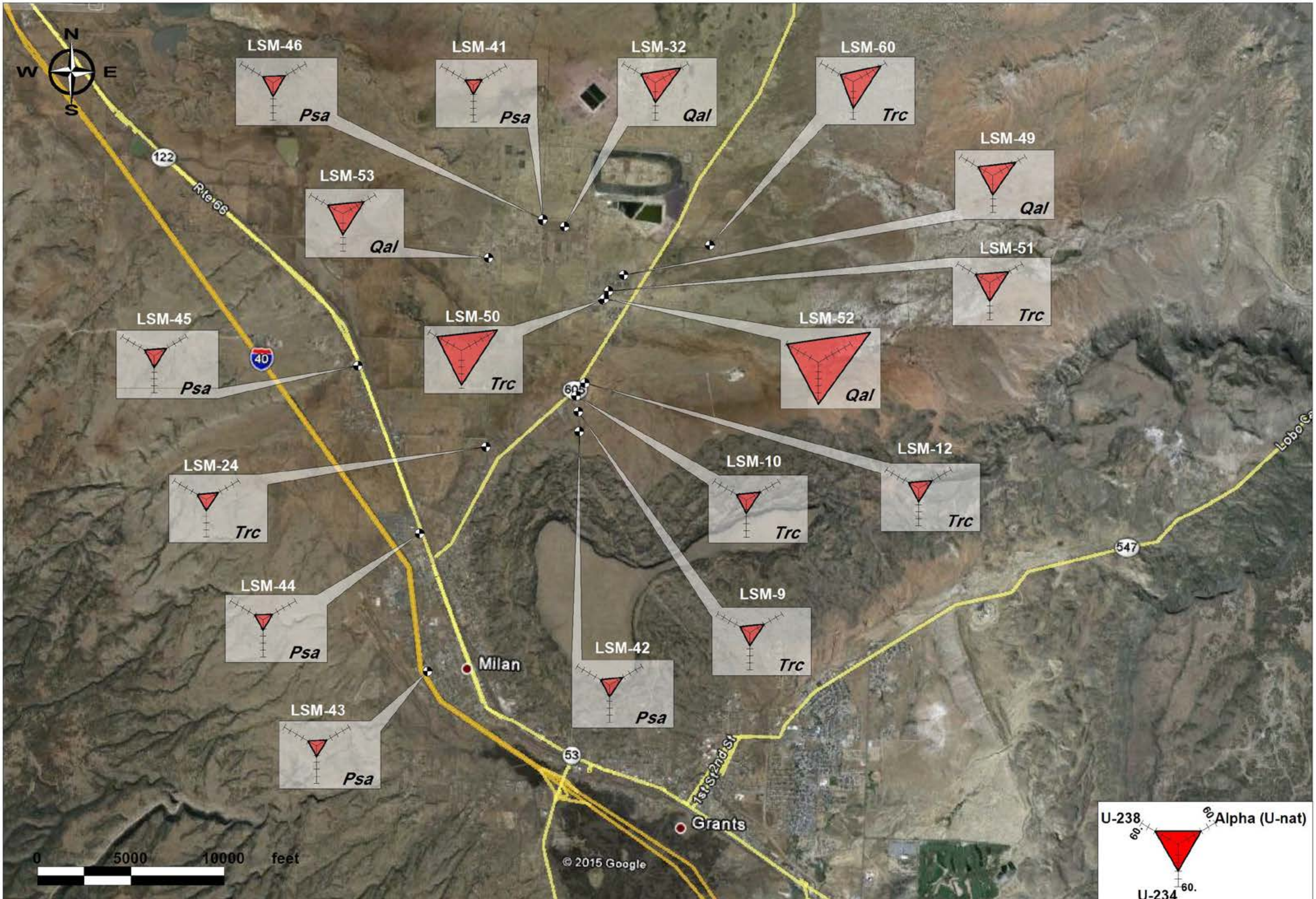


Figure 15

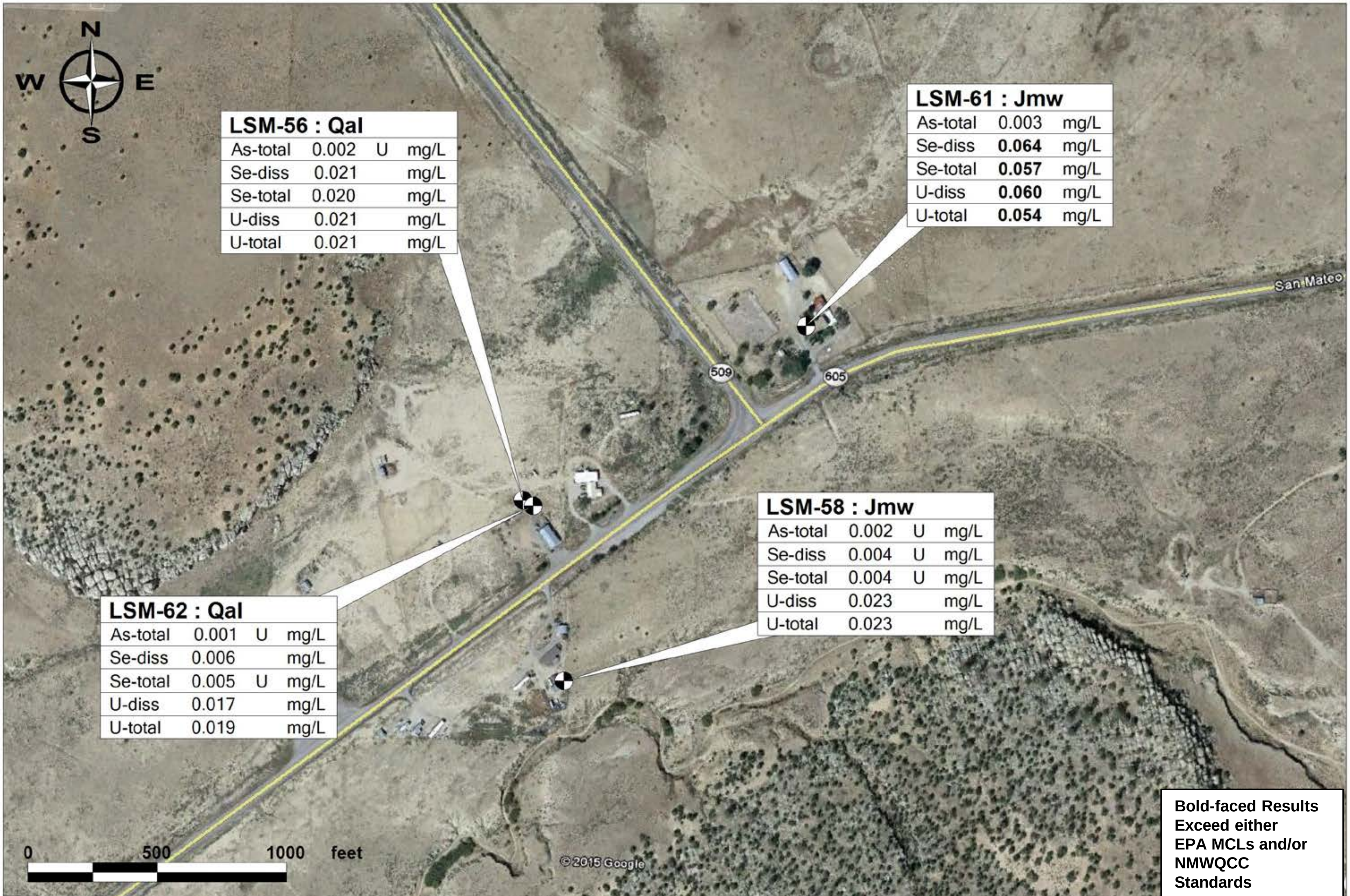
Radiochemistry Results - Radial Diagrams

Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico



LSM-56 : Qal

As-total	0.002	U	mg/L
Se-diss	0.021		mg/L
Se-total	0.020		mg/L
U-diss	0.021		mg/L
U-total	0.021		mg/L

LSM-61 : Jmw

As-total	0.003	mg/L
Se-diss	**0.064**	mg/L
Se-total	**0.057**	mg/L
U-diss	**0.060**	mg/L
U-total	**0.054**	mg/L

LSM-58 : Jmw

As-total	0.002	U	mg/L
Se-diss	0.004	U	mg/L
Se-total	0.004	U	mg/L
U-diss	0.023		mg/L
U-total	0.023		mg/L

LSM-62 : Qal

As-total	0.001	U	mg/L
Se-diss	0.006		mg/L
Se-total	0.005	U	mg/L
U-diss	0.017		mg/L
U-total	0.019		mg/L

Figure 16

Total Metals & Dissolved Metals Results - Data Tables

Alluvial & Morrison/Westwater Aquifer Wells - Upper Basin Area

New Mexico Environment Department

Lower San Mateo Creek Site Reassessment

Cibola & McKinley Counties, New Mexico

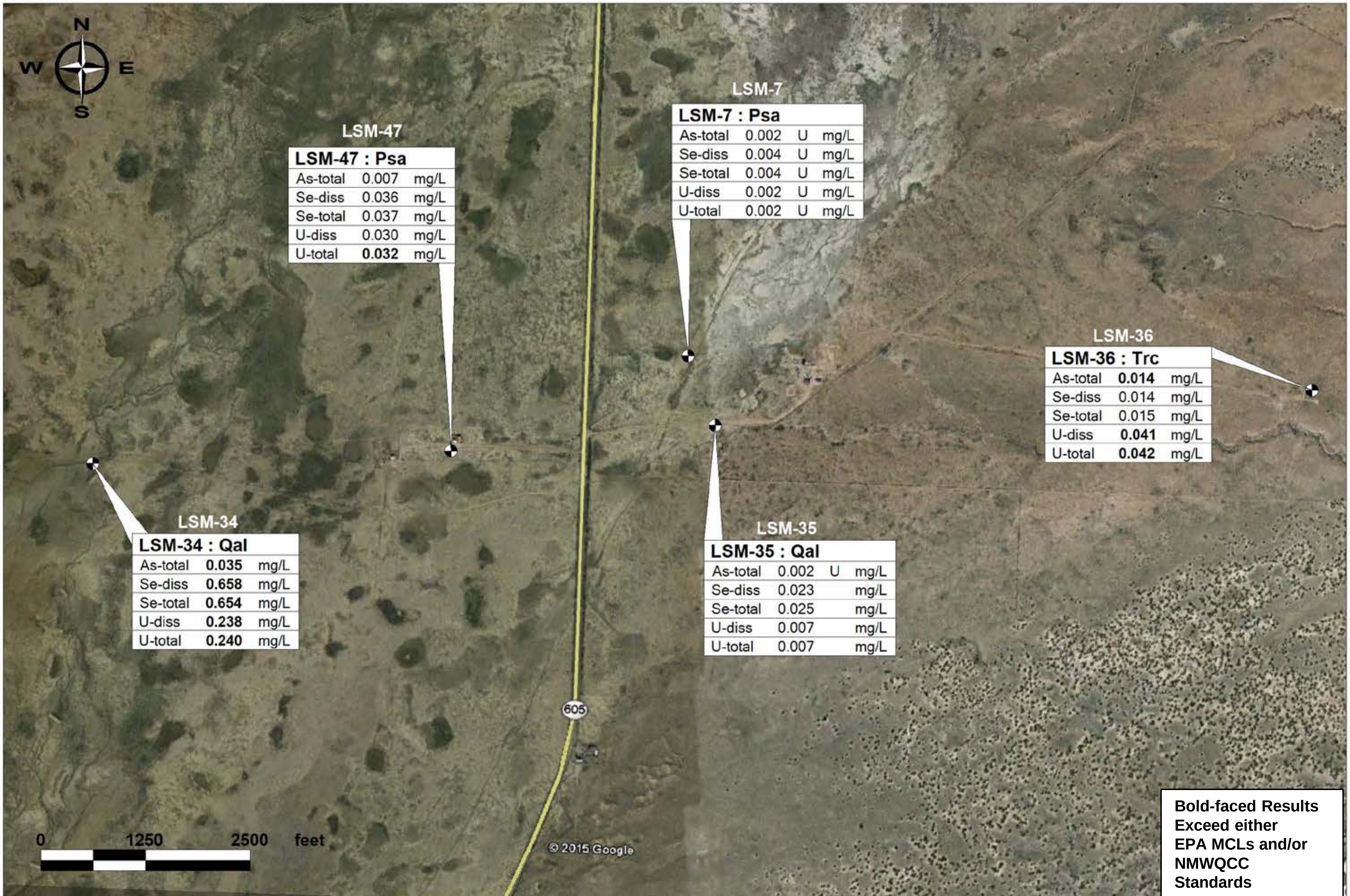


Figure 17

Total & Dissolved Metals Results - Data Tables

Alluvial, Chinle, & San Andres Aquifer Wells - Middle Basin Area

New Mexico Environment Department
Lower San Mateo Creek Basin Site Reassessment
Cibola and McKinley Counties, New Mexico

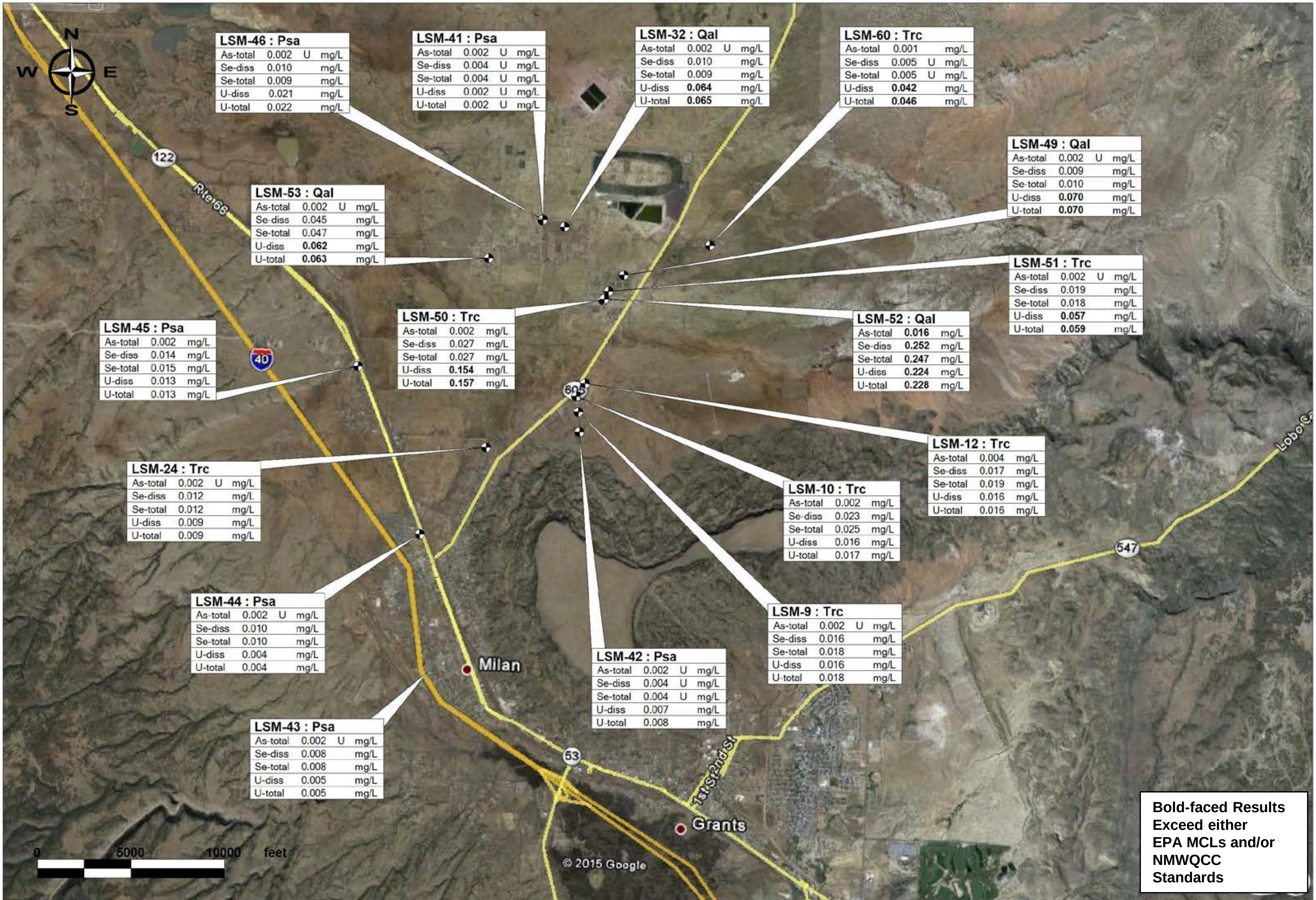


Figure 18

Total & Dissolved Metals Results - Data Tables

Alluvial, Chinle, & San Andres Aquifer Wells - Lower Basin Area

New Mexico Environment Department

Lower San Mateo Creek Basin Site Reassessment

Cibola and McKinley Counties, New Mexico

Tables

Table 1: Ground Water Well Usage within the San Mateo Creek Basin

GROUND WATER USAGE			TOTALS
Consumptive			2,213
	Single domestic wells [1]	203	
	Multiple domestic and community wells [1]	10	
	Municipal water supply wells [2]	2000	
Irrigation, sanitary, industrial, and stock wells			241
Other well usages	Including dewatering, exploration, mining, milling, oil, monitoring, no recorded use of right, observation, prospecting, construction, and no documented usage category		79

Notes:

[1] New Mexico Office of the State Engineer (OSE), 2011, New Mexico Water Rights Reporting System Database.

[2] New Mexico Drinking Water Bureau, Safe Drinking Water Information System (SDWIS) Database.
The Village of Milan Community Water System serves an estimated population of 2,000 people. There are three active water supply wells.

Table 2: Laboratory Analyses for General Chemistry, Total and Dissolved Metals, and Radiochemistry

Laboratory Analyses	**General Geochemistry**	**Metals (total-unfiltered & dissolved-filtered) [1]**	**Radionuclides (total-unfiltered) [2]**
Analytical Methods	EPA 160.1, 310.1 EPA 300.0, 340.2 EPA 353.2	ISM01.3 ICP-MS; SW-846/6010B; 200.8	EPA 900 series; 903.1; 904; 907; 910; ASTM D5072-92 for Radon
Analytes	TDS, HCO3, CO3 SO4, Cl, F NO3+NO2 Ca, K, Mg, Na	Al, As, Cu, Fe, Pb, Mo, Mn, Se, U (includes Ca, Cl, K, Mg, Na)	Gross Alpha, Ra-226, Ra-228, Th-227, Th-228, Th-230, Th-232, U-234, U-235, U-238 Rn(gas)

Notes:

[1] U.S. Environmental Protection Agency, Risk and Site Assessment Section (6SF-TR), 2013. Draft Human Health Risk Assessment, Homestake Mining Co. Superfund Site, Milan, Cibola County, New Mexico (Ref. 21)

[2] New Mexico Environment Department, Ground Water Quality Bureau, Superfund Oversight Section, 2007. Summary report on 2005-2006 residential well sampling within the vicinity of the Homestake Mining Company Uranium Mill Superfund Site, CERCLIS # NMD007860935, Cibola County, New Mexico (Ref 11)

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-7 10/8/2014	LSM-9 10/8/2014	LSM-10 10/7/2014	LSM-12 10/7/2014
Dissolved Metals							
Aluminum	mg/L	NA	0.1	0.5 U	0.3 U	0.2 U	0.2 U
Antimony	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	**0.0027**
Barium	mg/L	NA	1	0.05 U	0.03 U	0.02 U	**0.0222**
Beryllium	mg/L	NA	NP	0.025 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NA	NP	NA	NA	NA	NA
Cadmium	mg/L	NA	0.01	0.025 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NA	NP	**12.3**	**8.45**	**9.11**	**9.88**
Chromium	mg/L	NA	0.05	0.05 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NA	NP	0.1 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	NA	1	0.1 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NA	1	0.125 U	0.075 U	0.05 U	0.05 U
Lead	mg/L	NA	0.05	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NA	NP	**1.18**	**2.45**	**2.61**	**2.16**
Manganese	mg/L	NA	0.2	0.025 U	0.015 U	0.01 U	0.01 U
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	**0.0464**	**0.0026**	**0.0023**	**0.0032**
Nickel	mg/L	NA	NP	0.1 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NA	NP	5 U	**4.19 J**	**5.52 J**	**4.71 J**
Selenium	mg/L	NA	0.05	0.004 U	**0.0164**	**0.023**	**0.017**
Silver	mg/L	NA	0.05	0.05 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NA	NP	**1050 J**	**307 J**	**351 J**	**362 J**
Thallium	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NA	NP	NA	NA	NA	NA
Uranium	mg/L	NA	0.03	0.002 U	**0.0163**	**0.0159**	**0.0161**
Vanadium	mg/L	NA	NP	0.1 U	0.06 U	0.04 U	0.04 U
Zinc	mg/L	NA	10	0.1 U	0.06 U	0.04 U	**0.0719**
General Chemistry							
Estimated Alkalinity	mg/L	NP	NP	1169	498	534	**253**
Estimated Bicarbonate	mg/L	NP	NP	1169	498	534	NA
Calcium	mg/L	NP	NP	**12.3**	**8.45**	**9.11**	**9.88**
Carbonate	mg/L	NP	NP	NA	NA	NA	NA
Chloride	mg/L	NP	250	**476**	**45**	**49**	**50**
Fluoride	mg/L	NP	1.6	**1.82**	**0.93**	**0.89**	**0.93**
Iron	mg/L	NP	NP	0.125 U	0.075 U	0.05 U	0.05 U
Magnesium	mg/L	NP	NP	**1.18**	**2.45**	**2.61**	**2.16**
Manganese	mg/L	NP	NP	**0.0273**	0.015 U	0.01 U	0.01 U
Nitrate as N	mg/L	1	10	**0.02**	**1.9**	NA	**5.17**
Nitrate+Nitrite as N	mg/L	1	NP	0.04 U	**1.89**	**1.94**	**5.16**
Nitrite as N	mg/L	1	NP	0.0006 U	0.0006 U	NA	0.0006 U
pH	pH Units	6.5-8.5	6-9	**8.1**	**7.9**	**8.06**	**8.08**
Potassium	mg/L	NP	NP	5 U	**4.19 J**	**5.52 J**	**4.71 J**
Sodium	mg/L	NP	NP	**1050 J**	**307 J**	**351 J**	**362 J**
Sulfate	mg/L	250	600	**648**	**213**	**274**	**249**
Total Dissolved Solids	mg/L	500	1000	**2290**	**820**	**828**	**840**
Total Hardness	mg/L	NP	NP	NA	NA	NA	NA

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-7 10/8/2014	LSM-9 10/8/2014	LSM-10 10/7/2014	LSM-12 10/7/2014
Total Metals							
Aluminum	mg/L	NP	NA	0.5 U	0.3 U	0.2 U	0.2 U
Antimony	mg/L	0.006	NA	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	0.01	NA	0.002 U	0.002 U	**0.0024**	**0.0035**
Barium	mg/L	2	NA	0.05 U	0.03 U	**0.0204**	**0.0209**
Beryllium	mg/L	0.004	NA	0.025 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NP	NA	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	0.025 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NP	NA	**11.5**	**8.47**	**9.38**	**9.21**
Chromium	mg/L	0.1	NA	0.05 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NP	NA	0.1 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	1.3	NA	0.1 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NP	NA	0.125 U	**0.0887**	0.05 U	0.05 U
Lead	mg/L	0.015	NA	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NP	NA	**1.08**	**2.49**	**2.68**	**1.99**
Manganese	mg/L	NP	NA	**0.0273**	0.015 U	0.01 U	0.01 U
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	**0.0443**	**0.0027**	**0.0024**	**0.003**
Nickel	mg/L	NP	NA	0.1 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NP	NA	5 U	**5.37 J**	**6.14 J**	**4.92 J**
Selenium	mg/L	0.05	NA	0.004 U	**0.0176**	**0.0248**	**0.0188**
Silver	mg/L	NP	NA	0.05 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NP	NA	**1130 J**	**349 J**	**366 J**	**371 J**
Thallium	mg/L	0.002	NA	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NP	NA	NA	NA	NA	NA
Uranium	mg/L	0.03	NA	0.002 U	**0.0177**	**0.0167**	**0.0162**
Vanadium	mg/L	NP	NA	0.1 U	0.06 U	0.04 U	0.04 U
Zinc	mg/L	NP	NA	0.1 U	0.06 U	0.04 U	**0.0583**
Radiological							
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	**5.3 (+/- 1)**	**13.7 (+/- 1.2)**	**12.2 (+/- 1.1)**	**11.5 (+/- 1.1)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	**6.9 (+/- 1.3)**	**15.8 (+/- 1.4)**	**14.3 (+/- 1.3)**	**13.4 (+/- 1.3)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	2.9 U (+/- 1.5)	**3.8 (+/- 1.2)**	**4.7 (+/- 1.2)**	**6.6 (+/- 1.3)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	2.9 U (+/- 1.5)	**3.9 (+/- 1.3)**	**4.9 (+/- 1.3)**	**6.9 (+/- 1.3)**
Ra226, SDWA Method	pCi/L	5	30	**0.29 (+/- 0.02)**	**0.04 (+/- 0.01)**	**0.05 (+/- 0.01)**	**0.03 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	0.14 U (+/- 0.06)	0.14 U (+/- 0.08)	0.14 U (+/- 0.08)	**0.19 (+/- 0.08)**
Radon	pCi/L	NP	NP	**1124 (+/- 211)**	**125.5 (+/- 43.6)**	**336.6 (+/- 74.4)**	**218.5 (+/- 54.8)**
Radon 222	pCi/L	NP	NP	NA	NA	NA	NA
Radon 222 MDC	pCi/L	NP	NP	NA	NA	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	NA	NA	NA	NA
Thorium-228	pCi/L	NP	NP	**-0.193 (+/- 0.173)**	**-0.139 (+/- 0.152)**	**-0.067 (+/- 0.057)**	**-0.034 (+/- 0.071)**
Thorium-230	pCi/L	NP	NP	**-0.051 (+/- 0.167)**	**-0.008 (+/- 0.148)**	**0.000 (+/-0.043)**	**0.025 (+/- 0.039)**
Thorium-232	pCi/L	NP	NP	**-0.017 (+/- 0.167)**	**-0.03 (+/- 0.0148)**	**-0.019 (+/- 0.043)**	**0.00 (+/- 0.039)**
U234, by Alpha Spec	pCi/L	NP	NP	**2.8 (+/- 0.12)**	**8.1 (+/- 0.24)**	**8.1 (+/- 0.24)**	**8.8 (+/- 0.27)**
U238, by Alpha Spec	pCi/L	10	NP	**0.27 (+/- 0.03)**	**4.1 (+/- 0.13)**	**4.2 (+/- 0.14)**	**4.5 (+/- 0.16)**
Uranium, Mass Concentration	ug/L	30	NP	1 U (+/- 0.5)	**16 (+/- 1.6)**	**16 (+/- 1.6)**	**15 (+/- 1.5)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for Nitrite. Sample collector was notified. Analysis was performed per collector's request. No further corrective action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for Nitrite. Sample collector was notified. Analysis was performed per collector's request. No further corrective action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Protection Agency (EPA) for drinking water quality. An MCL is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act.

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicable to groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contaminants, these standards apply to dissolved metals.

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-24 10/7/2014	LSM-32 10/9/2014	LSM-34 10/7/2014	LSM-35 10/7/2014	LSM-36 10/6/2014
Dissolved Metals								
Aluminum	mg/L	NA	0.1	0.1 U	0.2 U	0.3 U	0.2 U	0.2 U
Antimony	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	NA	NP	0.002 U	0.002 U	**0.0342**	0.002 U	**0.0148**
Barium	mg/L	NA	1	**0.0309**	0.02 U	0.03 U	0.02 U	**0.0265**
Beryllium	mg/L	NA	NP	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NA	NP	NA	NA	NA	NA	NA
Cadmium	mg/L	NA	0.01	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NA	NP	**131**	**226 J**	**362**	**143**	**1.53**
Chromium	mg/L	NA	0.05	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	NA	1	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NA	1	**0.0422**	**0.267**	0.075 U	**0.896**	0.05 U
Lead	mg/L	NA	0.05	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NA	NP	**36.3**	**55.5**	**70.1**	**30.5**	0.3 U
Manganese	mg/L	NA	0.2	**0.0519**	**0.0133**	0.015 U	**0.0691**	0.01 U
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	0.002 U	0.002 U	**0.0036**	0.002 U	**0.0164**
Nickel	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NA	NP	**7.26 J**	**7.94 J**	**14.8 J**	**4.68 J**	2 U
Selenium	mg/L	NA	0.05	**0.012**	**0.0099**	**0.658**	**0.0229**	**0.0142**
Silver	mg/L	NA	0.05	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NA	NP	**88.8 J**	**353 J**	**483 J**	**421 J**	**307 J**
Thallium	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NA	NP	NA	NA	NA	NA	NA
Uranium	mg/L	NA	0.03	**0.0091**	**0.0642**	**0.238**	**0.0065**	**0.0411**
Vanadium	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	**0.308**
Zinc	mg/L	NA	10	0.02 U	**0.217**	0.06 U	0.04 U	0.04 U
General Chemistry								
Estimated Alkalinity	mg/L	NP	NP	**260**	780	526	332	**280**
Estimated Bicarbonate	mg/L	NP	NP	NA	780	526	332	NA
Calcium	mg/L	NP	NP	**131**	**226 J**	**362**	**143**	**1.53**
Carbonate	mg/L	NP	NP	NA	NA	NA	NA	NA
Chloride	mg/L	NP	250	**26**	**172**	**49**	**64**	**46**
Fluoride	mg/L	NP	1.6	**0.34**	0.25 U	0.25 U	0.25 U	**1.72**
Iron	mg/L	NP	NP	**0.0422**	**0.267**	0.075 U	**0.896**	0.05 U
Magnesium	mg/L	NP	NP	**36.3**	**55.5**	**70.1**	**30.5**	0.3 U
Manganese	mg/L	NP	NP	**0.0567**	**0.012**	**0.0152**	**0.104**	0.01 U
Nitrate as N	mg/L	1	10	**3.6**	**1.43**	**17**	NA	**16**
Nitrate+Nitrite as N	mg/L	1	NP	**3.62**	**1.43**	**17**	**1.04**	**16**
Nitrite as N	mg/L	1	NP	0.0006 U	0.0006 U	0.0006 U TQ03	NA	0.0006 U
pH	pH Units	6.5-8.5	6-9	**7.43**	**7.19**	**7.27**	**7.64**	**8.73**
Potassium	mg/L	NP	NP	**7.26 J**	**7.94 J**	**14.8 J**	**4.68 J**	2 U
Sodium	mg/L	NP	NP	**88.8 J**	**353 J**	**483 J**	**421 J**	**307 J**
Sulfate	mg/L	250	600	**303**	**649**	**1670**	**994**	**80**
Total Dissolved Solids	mg/L	500	1000	**840**	**2500**	**2940**	**1900**	**772**
Total Hardness	mg/L	NP	NP	NA	NA	NA	NA	NA

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-24 10/7/2014	LSM-32 10/9/2014	LSM-34 10/7/2014	LSM-35 10/7/2014	LSM-36 10/6/2014
Total Metals								
Aluminum	mg/L	NP	NA	0.1 U	0.2 U	0.3 U	**0.571**	0.2 U
Antimony	mg/L	0.006	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	0.01	NA	0.002 U	0.002 U	**0.0349**	0.002 U	**0.0137**
Barium	mg/L	2	NA	**0.0314**	0.02 U	0.03 U	**0.0203**	**0.0272**
Beryllium	mg/L	0.004	NA	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NP	NA	NA	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NP	NA	**128**	**223**	**362**	**153**	**1.57**
Chromium	mg/L	0.1	NA	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	1.3	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NP	NA	**0.708**	**0.424**	0.075 U	**8.18**	0.05 U
Lead	mg/L	0.015	NA	0.002 U	0.002 U	0.002 U	**0.0021**	0.002 U
Magnesium	mg/L	NP	NA	**35.9**	**56.3**	**69.6**	**32.3**	0.3 U
Manganese	mg/L	NP	NA	**0.0567**	**0.012**	**0.0152**	**0.104**	0.01 U
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	0.002 U	0.002 U	**0.0035**	0.002 U	**0.0165**
Nickel	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NP	NA	**7.44 J**	**9.25 J**	**16.5 J**	**5.55 J**	**2.09 J**
Selenium	mg/L	0.05	NA	**0.0115**	**0.0091**	**0.654**	**0.0249**	**0.0149**
Silver	mg/L	NP	NA	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NP	NA	**89.6 J**	**380 J**	**524 J**	**466 J**	**314 J**
Thallium	mg/L	0.002	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NP	NA	NA	NA	NA	NA	NA
Uranium	mg/L	0.03	NA	**0.0088**	**0.0652**	**0.24**	**0.0066**	**0.0424**
Vanadium	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	**0.306**
Zinc	mg/L	NP	NA	0.02 U	**0.224**	0.06 U	0.04 U	0.04 U
Radiological								
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	**8 (+/- 1.1)**	**37.2 (+/- 2.9)**	**87.8 (+/- 5)**	**3.9 (+/- 0.8)**	**26.5 (+/- 1.9)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	**10.2 (+/- 1.4)**	**42.5 (+/- 3.3)**	**116.9 (+/- 6.6)**	**5.1 (+/- 1)**	**29.5 (+/- 2.1)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	**4.5 (+/- 1.1)**	**12.5 (+/- 3.1)**	**87.8 (+/- 5.2)**	**4.6 (+/- 1.2)**	**6.9 (+/- 1.7)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	**4.5 (+/- 1.1)**	**13 (+/- 3.2)**	**88.9 (+/- 5.2)**	**4.5 (+/- 1.2)**	**7.2 (+/- 1.8)**
Ra226, SDWA Method	pCi/L	5	30	**0.11 (+/- 0.01)**	**0.12 (+/- 0.01)**	**0.2 (+/- 0.02)**	**0.07 (+/- 0.02)**	**0.04 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	0.14 U (+/- 0.06)	**0.2 (+/- 0.08)**	**0.19 (+/- 0.08)**	0.26 U (+/- 0.15)	0.14 U (+/- 0.07)
Radon	pCi/L	NP	NP	**804 (+/- 154)**	NA	**830 (+/- 161)**	**321.9 (+/- 71.6)**	**436.5 (+/- 89.8)**
Radon 222	pCi/L	NP	NP	NA	**691**	NA	NA	NA
Radon 222 MDC	pCi/L	NP	NP	NA	**103**	NA	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	NA	**68.8**	NA	NA	NA
Thorium-228	pCi/L	NP	NP	**-0.051 (+/- 0.166)**	**-0.021 (+/- 0.188)**	**-0.097 (+/- 0.158)**	**-0.018 (+/- 0.118)**	**-0.104 (+/- 0.122)**
Thorium-230	pCi/L	NP	NP	**-0.02 (+/-0.047)**	**-0.045 (+/- 0.173)**	**0.064 (+/- 0.154)**	**0.018 (+/- 0.049)**	**0.009 (+/- 0.061)**
Thorium-232	pCi/L	NP	NP	**0.02 (+/- 0.047)**	**-0.045 (+/- 0.173)**	**-0.008 (+/- 0.154)**	**0.071 (+/- 0.070)**	**0.028 (+/- 0.043)**
U234, by Alpha Spec	pCi/L	NP	NP	**4 (+/- 0.12)**	**22.1 (+/- 0.63)**	**75.2 (+/- 2.06)**	**2.3 (+/- 0.12)**	**17.2 (+/- 0.47)**
U238, by Alpha Spec	pCi/L	10	NP	**2 (+/- 0.07)**	**16.3 (+/- 0.48)**	**60.2 (+/- 1.72)**	**1.6 (+/- 0.1)**	**11.2 (+/- 0.32)**
Uranium, Mass Concentration	ug/L	30	NP	**9 (+/- 0.9)**	**58 (+/- 5.8)**	**210 (+/- 21)**	**6 (+/- 0.6)**	**39 (+/- 3.9)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Pr
An MCL is the legal threshold limit on the amount of a substance that is allowed in public

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicabl
groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contam

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-41 10/9/2014	LSM-42 10/8/2014	LSM-43 10/6/2014	LSM-44 10/6/2014	LSM-45 10/6/2014
Dissolved Metals								
Aluminum	mg/L	NA	0.1	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U
Antimony	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Barium	mg/L	NA	1	0.02 U	0.02 U	**0.0314**	**0.0237**	**0.0365**
Beryllium	mg/L	NA	NP	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U
Boron	mg/L	NA	NP	NA	NA	NA	NA	NA
Cadmium	mg/L	NA	0.01	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U
Calcium	mg/L	NA	NP	**6.24**	**113**	**76.9**	**81.8**	**140**
Chromium	mg/L	NA	0.05	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U
Cobalt	mg/L	NA	NP	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Copper	mg/L	NA	1	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Iron	mg/L	NA	1	0.05 U	**0.362**	0.025 U	0.025 U	0.025 U
Lead	mg/L	NA	0.05	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NA	NP	**4.56**	**39.7**	**30.3**	**27.4**	**40.2**
Manganese	mg/L	NA	0.2	0.01 U	**0.0737**	0.005 U	0.005 U	0.005 U
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	**0.0145**	0.002 U	**0.0033**	**0.0022**	0.002 U
Nickel	mg/L	NA	NP	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Potassium	mg/L	NA	NP	**5.45 J**	**9.45 J**	**3.74 J**	**4.05 J**	**7.25 J**
Selenium	mg/L	NA	0.05	0.004 U	0.004 U	**0.0081**	**0.0099**	**0.014**
Silver	mg/L	NA	0.05	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U
Sodium	mg/L	NA	NP	**213 J**	**211 J**	**44.9 J**	**50.8 J**	**111 J**
Thallium	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NA	NP	NA	NA	NA	NA	NA
Uranium	mg/L	NA	0.03	0.002 U	**0.0071**	**0.0049**	**0.0038**	**0.0127**
Vanadium	mg/L	NA	NP	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Zinc	mg/L	NA	10	0.04 U	**0.0693**	0.02 U	0.02 U	0.02 U
General Chemistry								
Estimated Alkalinity	mg/L	NP	NP	371	529	**212**	**208**	382
Estimated Bicarbonate	mg/L	NP	NP	371	529	NA	NA	382
Calcium	mg/L	NP	NP	**6.24**	**113**	**76.9**	**81.8**	**140**
Carbonate	mg/L	NP	NP	NA	NA	NA	NA	NA
Chloride	mg/L	NP	250	**54**	**80**	**48**	**14**	**38**
Fluoride	mg/L	NP	1.6	**0.73**	0.25 U	**0.37**	**0.35**	**0.3**
Iron	mg/L	NP	NP	0.05 U	**0.362**	0.025 U	0.025 U	0.025 U
Magnesium	mg/L	NP	NP	**4.56**	**39.7**	**30.3**	**27.4**	**40.2**
Manganese	mg/L	NP	NP	0.01 U	**0.0799**	0.005 U	0.005 U	0.005 U
Nitrate as N	mg/L	1	10	0 U	0 U	**3.32**	**2.87**	NA
Nitrate+Nitrite as N	mg/L	1	NP	0.04 U	0.04 U	**3.31**	**2.86**	**3.72**
Nitrite as N	mg/L	1	NP	0.0006 U	0.0006 U TQ02	0.0006 U	0.0006 U	NA
pH	pH Units	6.5-8.5	6-9	**8.6**	**7.01**	**7.27**	**7.31**	**7.37**
Potassium	mg/L	NP	NP	**5.45 J**	**9.45 J**	**3.74 J**	**4.05 J**	**7.25 J**
Sodium	mg/L	NP	NP	**213 J**	**211 J**	**44.9 J**	**50.8 J**	**111 J**
Sulfate	mg/L	250	600	**112**	**347**	**143**	**180**	**374**
Total Dissolved Solids	mg/L	500	1000	**790**	**1180**	**490**	**526**	**916**
Total Hardness	mg/L	NP	NP	NA	NA	NA	NA	NA

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-41 10/9/2014	LSM-42 10/8/2014	LSM-43 10/6/2014	LSM-44 10/6/2014	LSM-45 10/6/2014
Total Metals								
Aluminum	mg/L	NP	NA	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U
Antimony	mg/L	0.006	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	0.01	NA	0.002 U	0.002 U	0.002 U	0.002 U	**0.0021**
Barium	mg/L	2	NA	0.02 U	0.02 U	**0.0312**	**0.0262**	**0.037**
Beryllium	mg/L	0.004	NA	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U
Boron	mg/L	NP	NA	NA	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U
Calcium	mg/L	NP	NA	**6.06**	**123**	**77.9**	**85.6**	**147**
Chromium	mg/L	0.1	NA	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U
Cobalt	mg/L	NP	NA	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Copper	mg/L	1.3	NA	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Iron	mg/L	NP	NA	**0.172**	**0.421**	0.025 U	0.025 U	0.025 U
Lead	mg/L	0.015	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NP	NA	**4.49**	**43.7**	**30.1**	**28.8**	**41.6**
Manganese	mg/L	NP	NA	0.01 U	**0.0799**	0.005 U	0.005 U	0.005 U
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	**0.0129**	**0.002**	**0.0033**	**0.0022**	0.002 U
Nickel	mg/L	NP	NA	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Potassium	mg/L	NP	NA	**5.96 J**	**11.7 J**	**3.95 J**	**4.62 J**	**7.94 J**
Selenium	mg/L	0.05	NA	0.004 U	0.004 U	**0.0082**	**0.0099**	**0.0153**
Silver	mg/L	NP	NA	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U
Sodium	mg/L	NP	NA	**226 J**	**248 J**	**45.3 J**	**55.5 J**	**119 J**
Thallium	mg/L	0.002	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NP	NA	NA	NA	NA	NA	NA
Uranium	mg/L	0.03	NA	0.002 U	**0.0078**	**0.005**	**0.004**	**0.0129**
Vanadium	mg/L	NP	NA	0.04 U	0.04 U	0.02 U	0.02 U	0.02 U
Zinc	mg/L	NP	NA	0.04 U	**0.0718**	0.02 U	0.02 U	0.02 U
Radiological								
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	1.3 U (+/- 0.6)	**10.2 (+/- 1.1)**	**4.3 (+/- 0.9)**	**3 (+/- 0.6)**	**8.6 (+/- 1)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	1.4 U (+/- 0.7)	**12.6 (+/- 1.4)**	**5.5 (+/- 1.1)**	**3.6 (+/- 0.8)**	**10.5 (+/- 1.2)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	**2.6 (+/- 1)**	**12.8 (+/- 1.4)**	**3.9 (+/- 1)**	**4.7 (+/- 0.9)**	**7.2 (+/- 1.2)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	**2.8 (+/- 1.1)**	**13 (+/- 1.4)**	**4 (+/- 1)**	**4.8 (+/- 0.9)**	**7.4 (+/- 1.2)**
Ra226, SDWA Method	pCi/L	5	30	**0.11 (+/- 0.01)**	**2.4 (+/- 0.08)**	**0.08 (+/- 0.01)**	**0.08 (+/- 0.01)**	**0.18 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	0.14 U (+/- 0.06)	**3.1 (+/- 0.33)**	0.14 U (+/- 0.08)	0.15 U (+/- 0.08)	0.14 U (+/- 0.08)
Radon	pCi/L	NP	NP	NA	NA	**462.2 (+/- 94.4)**	**814 (+/- 156)**	**1113 (+/- 211)**
Radon 222	pCi/L	NP	NP	**65.7**	**746**	NA	NA	NA
Radon 222 MDC	pCi/L	NP	NP	**103**	**101**	NA	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	**60.3**	**68.2**	NA	NA	NA
Thorium-228	pCi/L	NP	NP	**-0.025 (+/- 0.211)**	**0.145 (+/- 0.218)**	**0.00 (+/- 0.078)**	**-0.051 (+/- 0.089)**	**-0.069 (+/- 0.093)**
Thorium-230	pCi/L	NP	NP	**0.000 (+/- 0.169)**	**-0.008 (+/- 0.165)**	**0.018 (+/- 0.089)**	**-0.042 (+/- 0.055)**	**-0.029 (+/-0.045)**
Thorium-232	pCi/L	NP	NP	**-0.026 (+/- 0.169)**	**0.03 (+/- 0.165)**	**-0.028 (+/- 0.048)**	**-0.034 (+/- 0.053)**	**0.029 (+/-0.045)**
U234, by Alpha Spec	pCi/L	NP	NP	0.03 U (+/- 0.01)	**5.3 (+/- 0.17)**	**2.9 (+/- 0.09)**	**2.1 (+/- 0.07)**	**5.8 (+/- 0.16)**
U238, by Alpha Spec	pCi/L	10	NP	0.02 U (+/- 0.01)	**1.7 (+/- 0.08)**	**1.3 (+/- 0.05)**	**0.92 (+/- 0.04)**	**3.4 (+/- 0.1)**
Uranium, Mass Concentration	ug/L	30	NP	1 U (+/- 0.5)	**7 (+/- 0.7)**	**5 (+/- 0.5)**	**4 (+/- 0.5)**	**12 (+/- 1.2)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Pr
An MCL is the legal threshold limit on the amount of a substance that is allowed in public

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicabl
groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contam

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 3: Lower San Mateo Creek Basin Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-80FD 10/6/2014	LSM-46 10/8/2014	LSM-47 10/7/2014	LSM-49 10/7/2014	LSM-85FD 10/7/2014
Dissolved Metals								
Aluminum	mg/L	NA	0.1	0.1 U	0.2 U	0.3 U	0.2 U	0.2 U
Antimony	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	NA	NP	0.002 U	0.002 U	**0.0077**	0.002 U	0.002 U
Barium	mg/L	NA	1	**0.0359**	0.02 U	0.03 U	0.02 U	0.02 U
Beryllium	mg/L	NA	NP	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NA	NP	NA	NA	NA	NA	NA
Cadmium	mg/L	NA	0.01	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NA	NP	**141**	**192**	**3.06**	**140**	**141**
Chromium	mg/L	NA	0.05	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	NA	1	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NA	1	0.025 U	0.05 U	0.075 U	0.05 U	0.05 U
Lead	mg/L	NA	0.05	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NA	NP	**40.2**	**63.2**	0.45 U	**42.3**	**42.7**
Manganese	mg/L	NA	0.2	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	0.002 U	0.002 U	**0.0095**	0.002 U	0.002 U
Nickel	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NA	NP	**7.08 J**	**17.7 J**	3 U	**11.1 J**	**11.2 J**
Selenium	mg/L	NA	0.05	**0.0139**	**0.0095**	**0.0359**	**0.009**	**0.0091**
Silver	mg/L	NA	0.05	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NA	NP	**110 J**	**269 J**	**497 J**	**312 J**	**313 J**
Thallium	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NA	NP	NA	NA	NA	NA	NA
Uranium	mg/L	NA	0.03	**0.0126**	**0.0214**	**0.0298**	**0.0695**	**0.0691**
Vanadium	mg/L	NA	NP	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Zinc	mg/L	NA	10	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
General Chemistry								
Estimated Alkalinity	mg/L	NP	NP	385	619	702	629	634
Estimated Bicarbonate	mg/L	NP	NP	385	619	702	629	634
Calcium	mg/L	NP	NP	**141**	**192**	**3.06**	**140**	**141**
Carbonate	mg/L	NP	NP	NA	NA	NA	NA	NA
Chloride	mg/L	NP	250	**38**	**151**	**45**	**138**	**138**
Fluoride	mg/L	NP	1.6	**0.26**	0.25 U	**1.49**	**0.56**	0.25 U
Iron	mg/L	NP	NP	0.025 U	0.05 U	0.075 U	0.05 U	0.05 U
Magnesium	mg/L	NP	NP	**40.2**	**63.2**	0.45 U	**42.3**	**42.7**
Manganese	mg/L	NP	NP	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Nitrate as N	mg/L	1	10	NA	**3.74**	NA	**1.43**	**1.48**
Nitrate+Nitrite as N	mg/L	1	NP	**3.69**	**3.74**	**0.58**	**1.42**	**1.47**
Nitrite as N	mg/L	1	NP	NA	0.0006 U TQ02	NA	0.0006 U TQ03	0.0006 U
pH	pH Units	6.5-8.5	6-9	**7.74**	**7.02**	**8.64**	**7.19**	**7.17**
Potassium	mg/L	NP	NP	**7.08 J**	**17.7 J**	3 U	**11.1 J**	**11.2 J**
Sodium	mg/L	NP	NP	**110 J**	**269 J**	**497 J**	**312 J**	**313 J**
Sulfate	mg/L	250	600	**372**	**590**	**420**	**475**	**478**
Total Dissolved Solids	mg/L	500	1000	**1110**	**1660**	**1300**	**1430**	**1430**
Total Hardness	mg/L	NP	NP	NA	NA	NA	NA	NA

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-80FD 10/6/2014	LSM-46 10/8/2014	LSM-47 10/7/2014	LSM-49 10/7/2014	LSM-85FD 10/7/2014
Total Metals								
Aluminum	mg/L	NP	NA	0.1 U	0.2 U	0.3 U	0.2 U	0.2 U
Antimony	mg/L	0.006	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	0.01	NA	0.002 U	0.002 U	**0.0067**	0.002 U	0.002 U
Barium	mg/L	2	NA	**0.0358**	0.02 U	0.03 U	0.02 U	0.02 U
Beryllium	mg/L	0.004	NA	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Boron	mg/L	NP	NA	NA	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Calcium	mg/L	NP	NA	**140**	**199**	**3.17**	**138**	**138**
Chromium	mg/L	0.1	NA	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Cobalt	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Copper	mg/L	1.3	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Iron	mg/L	NP	NA	0.025 U	**0.0511**	0.075 U	**0.0717**	**0.0703**
Lead	mg/L	0.015	NA	0.002 U	**0.0021**	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NP	NA	**39.7**	**66.8**	0.45 U	**42.2**	**42**
Manganese	mg/L	NP	NA	0.005 U	0.01 U	0.015 U	0.01 U	0.01 U
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	0.002 U	0.002 U	**0.01**	0.002 U	0.002 U
Nickel	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Potassium	mg/L	NP	NA	**7.35 J**	**21.1 J**	3 U	**12.6 J**	**12.9 J**
Selenium	mg/L	0.05	NA	**0.0134**	**0.0088**	**0.0374**	**0.0098**	**0.0102**
Silver	mg/L	NP	NA	0.01 U	0.02 U	0.03 U	0.02 U	0.02 U
Sodium	mg/L	NP	NA	**115 J**	**307 J**	**554 J**	**339 J**	**345 J**
Thallium	mg/L	0.002	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NP	NA	NA	NA	NA	NA	NA
Uranium	mg/L	0.03	NA	**0.0123**	**0.0223**	**0.0319**	**0.0702**	**0.0729**
Vanadium	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Zinc	mg/L	NP	NA	0.02 U	0.04 U	0.06 U	0.04 U	0.04 U
Radiological								
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	**6.9 (+/- 0.9)**	**8.2 (+/- 1.2)**	**23.1 (+/- 1.7)**	**30.1 (+/- 2)**	**28.7 (+/- 2.1)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	**8.3 (+/- 1.1)**	**10.1 (+/- 1.4)**	**28.5 (+/- 2.1)**	**36.1 (+/- 2.5)**	**37.3 (+/- 2.8)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	**8.2 (+/- 1.2)**	**14.9 (+/- 1.6)**	**8.8 (+/- 1.4)**	**27.6 (+/- 2.2)**	**21.7 (+/- 2)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	**8.5 (+/- 1.3)**	**15.3 (+/- 1.7)**	**8.9 (+/- 1.5)**	**28.6 (+/- 2.2)**	**21.8 (+/- 2)**
Ra226, SDWA Method	pCi/L	5	30	**0.17 (+/- 0.01)**	**0.25 (+/- 0.01)**	**0.04 (+/- 0.01)**	**0.06 (+/- 0.01)**	**0.07 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	**0.33 (+/- 0.08)**	0.14 U (+/- 0.07)	0.14 U (+/- 0.07)	0.14 U (+/- 0.08)	**0.19 (+/- 0.08)**
Radon	pCi/L	NP	NP	NA	NA	**773 (+/- 149)**	**904 (+/- 174)**	**907 (+/- 175)**
Radon 222	pCi/L	NP	NP	NA	**496**	NA	NA	NA
Radon 222 MDC	pCi/L	NP	NP	NA	**100**	NA	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	NA	**64.5**	NA	NA	NA
Thorium-228	pCi/L	NP	NP	NA	**0.098 (+/- 0.298)**	**-0.149 (+/- 0.103)**	**-0.045 (+/- 0.227)**	**0.082 (+/- 0.167)**
Thorium-230	pCi/L	NP	NP	NA	**0.026 (+/- 0.201)**	**-0.083 (+/-0.080)**	**-0.046 (+/- 0.180)**	**-0.029 (+/- 0.162)**
Thorium-232	pCi/L	NP	NP	NA	**0.073 (+/-0.201)**	**-0.009 (+/-0.042)**	**0.042 (+/- 0.180)**	**0.021 (+/- 0.162)**
U234, by Alpha Spec	pCi/L	NP	NP	**6.7 (+/- 0.2)**	**9.5 (+/- 0.27)**	**19.6 (+/- 0.6)**	**21.6 (+/- 0.63)**	**21.8 (+/- 0.63)**
U238, by Alpha Spec	pCi/L	10	NP	**3.6 (+/- 0.12)**	**5.7 (+/- 0.18)**	**8.4 (+/- 0.29)**	**16.8 (+/- 0.5)**	**16.1 (+/- 0.49)**
Uranium, Mass Concentration	ug/L	30	NP	**12 (+/- 1.2)**	**20 (+/- 2)**	**30 (+/- 3)**	**66 (+/- 6.6)**	**66 (+/- 6.6)**

Notes:

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action was taken

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action was taken.

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Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicabl
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NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-50 10/9/2014	LSM-51 10/8/2014	LSM-52 10/8/2014	LSM-53 10/8/2014	LSM-56 10/8/2014
Dissolved Metals								
Aluminum	mg/L	NA	0.1	0.2 U	0.2 U	0.2 U	0.3 U	0.2 U
Antimony	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	NA	NP	**0.002**	0.002 U	**0.0181**	0.002 U	0.002 U
Barium	mg/L	NA	1	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Beryllium	mg/L	NA	NP	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U
Boron	mg/L	NA	NP	NA	NA	NA	NA	NA
Cadmium	mg/L	NA	0.01	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U
Calcium	mg/L	NA	NP	**193**	**203**	**416**	**315**	**478**
Chromium	mg/L	NA	0.05	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Cobalt	mg/L	NA	NP	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Copper	mg/L	NA	1	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Iron	mg/L	NA	1	0.05 U	**0.843**	0.05 U	**0.192**	0.05 U
Lead	mg/L	NA	0.05	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	mg/L	NA	NP	**56.5**	**65.2**	**117**	**74.9**	**132**
Manganese	mg/L	NA	0.2	0.01 U	**0.0236**	0.01 U	0.015 U	0.01 U
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	**0.0661**	**0.0073**	**0.0123**	0.002 U	0.002 U
Nickel	mg/L	NA	NP	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Potassium	mg/L	NA	NP	**12.5 J**	**16.3 J**	**16.1 J**	**11.1 J**	**11.1 J**
Selenium	mg/L	NA	0.05	**0.0267**	**0.0192**	**0.252**	**0.0449**	**0.0205**
Silver	mg/L	NA	0.05	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Sodium	mg/L	NA	NP	**372 J**	**380 J**	**725 J**	**569 J**	**339 J**
Thallium	mg/L	NA	NP	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NA	NP	NA	NA	NA	NA	NA
Uranium	mg/L	NA	0.03	**0.154**	**0.0571**	**0.224**	**0.0624**	**0.0213**
Vanadium	mg/L	NA	NP	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Zinc	mg/L	NA	10	0.04 U	0.04 U	0.04 U	**0.546**	0.04 U
General Chemistry								
Estimated Alkalinity	mg/L	NP	NP	888	787	527	824	0
Estimated Bicarbonate	mg/L	NP	NP	888	787	527	824	0
Calcium	mg/L	NP	NP	**193**	**203**	**416**	**315**	**478**
Carbonate	mg/L	NP	NP	NA	NA	NA	NA	NA
Chloride	mg/L	NP	250	**146**	**178**	**567**	**236**	**45**
Fluoride	mg/L	NP	1.6	0.25 U	0.25 U	0.25 U	0.25 U	**0.51**
Iron	mg/L	NP	NP	0.05 U	**0.843**	0.05 U	**0.192**	0.05 U
Magnesium	mg/L	NP	NP	**56.5**	**65.2**	**117**	**74.9**	**132**
Manganese	mg/L	NP	NP	0.01 U	**0.024**	0.01 U	**0.0152**	0.01 U
Nitrate as N	mg/L	1	10	**1.94**	**1.66**	**16.4**	**3.54**	**17.2**
Nitrate+Nitrite as N	mg/L	1	NP	**1.94**	**1.67**	**16.4**	**3.53**	**17.2**
Nitrite as N	mg/L	1	NP	0.0006 U	0.0006 U TQ02	0.0006 U	0.0006 U	0.0006 U
pH	pH Units	6.5-8.5	6-9	**7.14**	**7.01**	**7.12**	**7.1**	**7.15**
Potassium	mg/L	NP	NP	**12.5 J**	**16.3 J**	**16.1 J**	**11.1 J**	**11.1 J**
Sodium	mg/L	NP	NP	**372 J**	**380 J**	**725 J**	**569 J**	**339 J**
Sulfate	mg/L	250	600	**567**	**685**	**1790**	**1270**	**2380**
Total Dissolved Solids	mg/L	500	1000	**2300**	**1960**	**3930**	**2870**	**3430**
Total Hardness	mg/L	NP	NP	NA	NA	NA	NA	NA

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-50 10/9/2014	LSM-51 10/8/2014	LSM-52 10/8/2014	LSM-53 10/8/2014	LSM-56 10/8/2014
Total Metals								
Aluminum	mg/L	NP	NA	0.2 U	0.2 U	0.2 U	0.3 U	0.2 U
Antimony	mg/L	0.006	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	mg/L	0.01	NA	**0.0021**	0.002 U	**0.0161**	0.002 U	0.002 U
Barium	mg/L	2	NA	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Beryllium	mg/L	0.004	NA	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U
Boron	mg/L	NP	NA	NA	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U
Calcium	mg/L	NP	NA	**195**	**208**	**418**	**308**	**456**
Chromium	mg/L	0.1	NA	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Cobalt	mg/L	NP	NA	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Copper	mg/L	1.3	NA	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Iron	mg/L	NP	NA	0.05 U	**1.06**	**0.0625**	**0.686**	0.05 U
Lead	mg/L	0.015	NA	0.002 U	0.002 U	0.002 U	**0.0023**	0.002 U
Magnesium	mg/L	NP	NA	**57.4**	**68.4**	**119**	**74.1**	**128**
Manganese	mg/L	NP	NA	0.01 U	**0.024**	0.01 U	**0.0152**	0.01 U
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	**0.063**	**0.0068**	**0.0107**	0.002 U	0.002 U
Nickel	mg/L	NP	NA	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Potassium	mg/L	NP	NA	**14.1 J**	**19.4 J**	**19.2 J**	**12.6 J**	**12 J**
Selenium	mg/L	0.05	NA	**0.0267**	**0.018**	**0.247**	**0.0466**	**0.02**
Silver	mg/L	NP	NA	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U
Sodium	mg/L	NP	NA	**398 J**	**429 J**	**804 J**	**620 J**	**361 J**
Thallium	mg/L	0.002	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	mg/L	NP	NA	NA	NA	NA	NA	NA
Uranium	mg/L	0.03	NA	**0.157**	**0.0588**	**0.228**	**0.0625**	**0.0208**
Vanadium	mg/L	NP	NA	0.04 U	0.04 U	0.04 U	0.06 U	0.04 U
Zinc	mg/L	NP	NA	0.04 U	0.04 U	0.04 U	**0.641**	0.04 U
Radiological								
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	**54.7 (+/- 3.2)**	**21.2 (+/- 1.7)**	**70.5 (+/- 4.9)**	**24.2 (+/- 2)**	**8.8 (+/- 1.3)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	**68.1 (+/- 3.9)**	**26.9 (+/- 2.2)**	**108.2 (+/- 7.5)**	**32.6 (+/- 2.7)**	**12.2 (+/- 1.9)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	**49.9 (+/- 3.2)**	**21.9 (+/- 2)**	**73 (+/- 5.1)**	**24.4 (+/- 2.1)**	**10.5 (+/- 1.7)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	**50.8 (+/- 3.3)**	**22 (+/- 2)**	**68.2 (+/- 4.7)**	**24.3 (+/- 2.1)**	**10.4 (+/- 1.6)**
Ra226, SDWA Method	pCi/L	5	30	**0.03 (+/- 0.01)**	**0.03 (+/- 0.01)**	**0.09 (+/- 0.01)**	**0.18 (+/- 0.02)**	**0.07 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	0.14 U (+/- 0.08)	0.13 U (+/- 0.07)	0.36 U (+/- 0.19)	**0.2 (+/- 0.07)**	0.96 U (+/- 0.47)
Radon	pCi/L	NP	NP	NA	NA	NA	**417.5 (+/- 88.3)**	**992 (+/- 188)**
Radon 222	pCi/L	NP	NP	**676**	**251**	**736**	NA	NA
Radon 222 MDC	pCi/L	NP	NP	**69.2**	**60.8**	**67.6**	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	**104**	**99**	**100**	NA	NA
Thorium-228	pCi/L	NP	NP	**0.016 (+/- 0.198)**	**-0.079 (+/- 0.195)**	**-0.038 (+/- 0.311)**	**0.001 (+/- 0.171)**	**0.043 (+/- 0.341)**
Thorium-230	pCi/L	NP	NP	**0.131 (+/- 0.187)**	**-0.02 (+/- 0.191)**	**0.302 (+/- 0.315)**	**-0.052 (+/- 0.168)**	**-0.102 (+/- 0.210)**
Thorium-232	pCi/L	NP	NP	**0.044 (+/- 0.186)**	**0.000 (+/- 0.191)**	**0.179 (+/- 0.225)**	**0.048 (+/- 0.168)**	**0.05 (+/- 216)**
U234, by Alpha Spec	pCi/L	NP	NP	**54.1 (+/- 1.66)**	**20.1 (+/- 0.62)**	**69.5 (+/- 2)**	**25.2 (+/- 0.76)**	**11.3 (+/- 0.41)**
U238, by Alpha Spec	pCi/L	10	NP	**40.5 (+/- 1.29)**	**15.5 (+/- 0.5)**	**58.2 (+/- 1.71)**	**16.7 (+/- 0.53)**	**6.1 (+/- 0.26)**
Uranium, Mass Concentration	ug/L	30	NP	**140 (+/- 14)**	**52 (+/- 5.2)**	**200 (+/- 20)**	**57 (+/- 5.7)**	**21 (+/- 2.1)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Pr
An MCL is the legal threshold limit on the amount of a substance that is allowed in public

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicabl
groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contam

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 3: Lower San Mateo Creek Basin Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-58 10/8/2014	LSM-60 1/7/2015	LSM-61 1/7/2015	LSM-62 1/7/2015
Dissolved Metals							
Aluminum	mg/L	NA	0.1	0.1 U	0.01 U	0.01 U	0.01 U
Antimony	mg/L	NA	NP	0.002 U	0.001 U	0.001 U	0.001 U
Arsenic	mg/L	NA	NP	0.002 U	**0.002**	**0.004**	**0.002**
Barium	mg/L	NA	1	**0.0298**	0.1 U	0.1 U	0.1 U
Beryllium	mg/L	NA	NP	0.005 U	0.001 U	0.001 U	0.001 U
Boron	mg/L	NA	NP	NA	**1.8**	**0.07**	**0.27**
Cadmium	mg/L	NA	0.01	0.005 U	0.001 U	0.001 U	0.001 U
Calcium	mg/L	NA	NP	**74.6**	**15**	**85**	**510**
Chromium	mg/L	NA	0.05	0.01 U	0.001 U	**0.001**	0.001 U
Cobalt	mg/L	NA	NP	0.02 U	0.001 U	0.001 U	0.001 U
Copper	mg/L	NA	1	0.02 U	0.01 U	0.01 U	0.01 U
Iron	mg/L	NA	1	**0.101**	0.05 U	0.05 U	**0.087**
Lead	mg/L	NA	0.05	0.002 U	0.001 U	0.001 U	0.001 U
Magnesium	mg/L	NA	NP	**8.06**	**1.8**	**15**	**150**
Manganese	mg/L	NA	0.2	**0.037**	**0.008**	**0.062**	**0.017**
Mercury	mg/L	NA	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NA	NP	**0.007**	**0.026**	0.001 U	**0.003**
Nickel	mg/L	NA	NP	0.02 U	0.01 U	0.01 U	**0.014**
Potassium	mg/L	NA	NP	**5.7 J**	NA	**5**	**7**
Selenium	mg/L	NA	0.05	0.004 U	0.005 U	**0.064**	**0.006**
Silver	mg/L	NA	0.05	0.01 U	0.001 U	0.001 U	0.001 U
Sodium	mg/L	NA	NP	**38.5 J**	**681**	**58**	NA
Thallium	mg/L	NA	NP	0.002 U	0.001 U	0.001 U	0.001 U
Total Hardness	mg/L	NA	NP	NA	**45**	**270**	**1900**
Uranium	mg/L	NA	0.03	**0.0234**	**0.042**	**0.06**	**0.017**
Vanadium	mg/L	NA	NP	0.02 U	**0.008**	0.001 U	0.001 U
Zinc	mg/L	NA	10	0.02 U	0.01 U	**0.013**	**0.1**
General Chemistry							
Estimated Alkalinity	mg/L	NP	NP	248	**377 A**	**259 A**	**168 A**
Estimated Bicarbonate	mg/L	NP	NP	248	**371**	**259**	**168**
Calcium	mg/L	NP	NP	**74.6**	**15**	**85**	**510**
Carbonate	mg/L	NP	NP	NA	**5.84**	**0**	**0**
Chloride	mg/L	NP	250	5 U	**444**	**16**	**49.8**
Fluoride	mg/L	NP	1.6	**0.49**	**1.42 A**	**0.14 A**	**0.45 A**
Iron	mg/L	NP	NP	**0.101**	0.05 U	0.05 U	**0.087**
Magnesium	mg/L	NP	NP	**8.06**	**1.8**	**15**	**150**
Manganese	mg/L	NP	NP	**0.0376**	**0.007**	**0.053**	**0.018**
Nitrate as N	mg/L	1	10	**0.02**	NA	NA	NA
Nitrate+Nitrite as N	mg/L	1	NP	0.04 U	**0.69**	**1.16**	**15**
Nitrite as N	mg/L	1	NP	0.0006 U	NA	NA	NA
pH	pH Units	6.5-8.5	6-9	**7.46**	**8.37**	**7.97**	**7.63**
Potassium	mg/L	NP	NP	**5.7 J**	NA	**5**	**7**
Sodium	mg/L	NP	NP	**38.5 J**	**681**	**58**	NA
Sulfate	mg/L	250	600	**91**	**664**	**100**	**2030**
Total Dissolved Solids	mg/L	500	1000	**322**	**2080**	**444**	**3340**
Total Hardness	mg/L	NP	NP	NA	NA	NA	**1900**

Table 3: Lower San Mateo Creek Basin
Sampling Analytical Results

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	LSM-58 10/8/2014	LSM-60 1/7/2015	LSM-61 1/7/2015	LSM-62 1/7/2015
Total Metals							
Aluminum	mg/L	NP	NA	0.1 U	**0.019**	**0.02**	0.01 U
Antimony	mg/L	0.006	NA	0.002 U	0.001 U	0.001 U	0.001 U
Arsenic	mg/L	0.01	NA	0.002 U	**0.001**	**0.003**	0.001 U
Barium	mg/L	2	NA	**0.0311**	0.1 U	0.1 U	0.1 U
Beryllium	mg/L	0.004	NA	0.005 U	0.001 U	0.001 U	0.001 U
Boron	mg/L	NP	NA	NA	**1.6**	**0.07**	**0.28**
Cadmium	mg/L	0.005	NA	0.005 U	0.001 U	0.001 U	0.001 U
Calcium	mg/L	NP	NA	**72.3**	**13**	**76**	**520**
Chromium	mg/L	0.1	NA	0.01 U	0.001 U	0.001 U	0.001 U
Cobalt	mg/L	NP	NA	0.02 U	0.001 U	0.001 U	0.001 U
Copper	mg/L	1.3	NA	0.02 U	0.01 U	0.01 U	0.01 U
Iron	mg/L	NP	NA	**0.119**	NA	NA	NA
Lead	mg/L	0.015	NA	0.002 U	0.001 U	0.001 U	0.001 U
Magnesium	mg/L	NP	NA	**7.84**	**1.5**	**14**	**160**
Manganese	mg/L	NP	NA	**0.0376**	**0.007**	**0.053**	**0.018**
Mercury	mg/L	0.002	NA	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	mg/L	NP	NA	**0.0067**	**0.026**	0.001 U	**0.003**
Nickel	mg/L	NP	NA	0.02 U	0.01 U	0.01 U	**0.016**
Potassium	mg/L	NP	NA	**6.41 J**	NA	NA	NA
Selenium	mg/L	0.05	NA	0.004 U	0.005 U	**0.057**	0.005 U
Silver	mg/L	NP	NA	0.01 U	0.001 U	0.001 U	0.001 U
Sodium	mg/L	NP	NA	**41.8 J**	NA	NA	NA
Thallium	mg/L	0.002	NA	0.002 U	0.001 U	0.001 U	0.001 U
Total Hardness	mg/L	NP	NA	NA	**38**	**250**	**2000**
Uranium	mg/L	0.03	NA	**0.023**	**0.046**	**0.054**	**0.019**
Vanadium	mg/L	NP	NA	0.02 U	**0.008**	0.001 U	0.001 U
Zinc	mg/L	NP	NA	0.02 U	**0.01**	**0.01**	**0.06**
Radiological							
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	**20.6 (+/- 2.1)**	**37.2 (+/- 2.5)**	**36.3 (+/- 3.7)**	**9.6 (+/- 1.3)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	**25.6 (+/- 2.7)**	**48.8 (+/- 3.3)**	**46.9 (+/- 4.7)**	**13.3 (+/- 1.8)**
Gross Beta w/ Cs-137 Reference	pCi/L	NP	NP	**9.1 (+/- 1.7)**	**8.3 (+/- 1.9)**	**17.4 (+/- 2.7)**	**11.4 (+/- 1.7)**
Gross Beta w/ Sr/Y-90 Reference	pCi/L	NP	NP	**9.3 (+/- 1.7)**	**8.3 (+/- 1.8)**	**17.4 (+/- 2.7)**	**11.4 (+/- 1.7)**
Ra226, SDWA Method	pCi/L	5	30	**0.74 (+/- 0.03)**	**0.04 (+/- 0.02)**	**1.16 (+/- 0.04)**	**0.14 (+/- 0.01)**
Ra228, SDWA Method	pCi/L	5	30	**0.4 (+/- 0.08)**	**0.16 (+/- 0.08)**	**0.94 (+/- 0.12)**	**0.28 (+/- 0.09)**
Radon	pCi/L	NP	NP	**1314 (+/- 245)**	**495 (+/- 101)**	**55.8 (+/- 33.0)**	**779 (+/- 150)**
Radon 222	pCi/L	NP	NP	NA	NA	NA	NA
Radon 222 MDC	pCi/L	NP	NP	NA	NA	NA	NA
Radon 222 Precision +/-	pCi/L	NP	NP	NA	NA	NA	NA
Thorium-228	pCi/L	NP	NP	**0.068 (+/- 0.227)**	**0.189 (+/- 0.145)**	**0.026 (+/- 0.108)**	**-0.026 (+/- 0.111)**
Thorium-230	pCi/L	NP	NP	**0.04 (+/- 0.172)**	**0.217 (+/- 0.124)**	**-0.017 (+/- 0.072)**	**-0.043 (+/- 0.057)**
Thorium-232	pCi/L	NP	NP	**0.013 (+/- 0.167)**	**0.070 (+/- 0.077)**	**0.009 (+/- 0.045)**	**-0.061 (+/- 0.052)**
U234, by Alpha Spec	pCi/L	NP	NP	**16.5 (+/- 0.45)**	**37.1 (+/- 1.2)**	**28.9 (+/- 0.8)**	**7.4 (+/- 0.27)**
U238, by Alpha Spec	pCi/L	10	NP	**6.5 (+/- 0.19)**	**11.5 (+/- 0.45)**	**18.3 (+/- 0.52)**	**4.29 (+/- 0.18)**
Uranium, Mass Concentration	ug/L	30	NP	**22 (+/- 2.2)**	**44 (+/- 4.4)**	**61 (+/- 6.1)**	**18 (+/- 1.8)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for
Sample collector was notified. Analysis was performed per collector's request. No further corre
action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Pr
An MCL is the legal threshold limit on the amount of a substance that is allowed in public

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicabl
groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contam

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.

Table 4: Lower San Mateo Creek Basin
Comparison to Historical Data

Analyte	Units	National Primary Drinking Water Standard Maximum Contaminant Level (MCL)	New Mexico Water Quality Control Commission (NMWQCC)	SMC-13 4/2/2009	LSM-34 10/7/2014	SMC-10 3/30/2009	LSM-35 10/7/2014	SMC-20 3/31/2009	LSM-61 1/7/2015
Dissolved Metals									
Calcium	mg/L	NA	NP	389	362	567	143	92.3	85
Iron	mg/L	NA	1	0.025	0.075 U	0.025	0.896	0.025	0.05 U
Magnesium	mg/L	NA	NP	73.7	70.1	149	30.5	15.8	15
Manganese	mg/L	NA	0.2	0.0115	0.015 U	0.005	0.0691	0.057	0.062
Potassium	mg/L	NA	NP	8.44	14.8 J	6.95	4.68 J	5.9	5
Selenium	mg/L	NA	0.05	**0.618**	**0.658**	0.0321	0.0229	**0.0736**	**0.064**
Sodium	mg/L	NA	NP	355	483 J	261	421 J	67.9	58
Uranium	mg/L	NA	0.03	**0.24**	**0.238**	**0.0309**	0.0065	**0.0639**	**0.06**
General Chemistry									
Estimated Bicarbonate	mg/L	NP	NP	180	526	170	332	260	259
Carbonate	mg/L	NP	NP	10	NA	10	NA	10	0
Chloride	mg/L	NP	250	59	49	47	64	15	16
Fluoride	mg/L	NP	1.6	0.5	0.25 U	0.56	0.25 U	0.25	0.14 A
Nitrate+Nitrite as N	mg/L	1	NP	**18.6**	**17**	**21.2**	**1.04**	**1.08**	**1.16**
Sulfate	mg/L	250	600	**1610**	**1670**	**2110**	**994**	96	100
Total Dissolved Solids	mg/L	500	1000	**2710**	**2940**	**3380**	**1900**	**504**	444
Total Metals									
Arsenic	mg/L	0.01	NA	**0.0377**	**0.0349**	0.002U	0.002 U	0.005	0.003
Selenium	mg/L	0.05	NA	**0.604**	**0.654**	0.0314	0.0249	**0.074**	**0.057**
Uranium	mg/L	0.03	NA	**0.24**	**0.24**	**0.0305**	0.0066	**0.066**	**0.054**
Radiological									
Gross Alpha w/ Am-241 Reference	pCi/L	15	NP	NA	**87.8 (+/- 5)**	NA	3.9 (+/- 0.8)	NA	**36.3 (+/- 3.7)**
Gross Alpha w/ U-nat Reference	pCi/L	15	NP	NA	**116.9 (+/- 6.6)**	NA	5.1 (+/- 1)	NA	**46.9 (+/- 4.7)**
U234, by Alpha Spec	pCi/L	NP	NP	75.8 (+/- 6.2)	75.2 (+/- 2.06)	0.1 (+/- 0.09)	2.3 (+/- 0.12)	30.4 (+/- 2.7)	28.9 (+/- 0.8)
U238, by Alpha Spec	pCi/L	10	NP	**64.3 (+/- 5.3)**	**60.2 (+/- 1.72)**	0.04 (+/- 0.06)	1.6 (+/- 0.1)	**17.4 (+/- 1.7)**	**18.3 (+/- 0.52)**
Uranium, Mass Concentration	ug/L	30	NP	NA	**210 (+/- 21)**	NA	6 (+/- 0.6)	NA	**61 (+/- 6.1)**

Notes:

U - Analyte not detected

NA - Not Applicable

NP - Not Published

J - The identification of the analyte is acceptable; the reported value is an estimate

A - This sample was extracted at a single acid pH.

TQ02 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for Nitrite. Sample collector was notified. Analysis was performed per collector's request. No further corrective action was taken

TQ03 - Sample received at laboratory with insufficient holding time remaining to conduct analysis for Nitrite. Sample collector was notified. Analysis was performed per collector's request. No further corrective action was taken.

mg/L - milligrams per Liter. Milligrams per Liter are equivalent to parts per million.

ug/L - micrograms/Liter. Micrograms per Liter are equivalent to parts per billion.

pCi/L - picocuries per Liter

Maximum Contaminant Levels (MCLs) are standards that are set by the United States Enviromental Protection Agency (EPA) for drinking water quality. An MCL is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act.

Alkalinity and Bicarbonate estimated by Anion and Cation Balance Calculation

New Mexico Water Quality Control Commission Standard (NWQCC) Health-based standards applicable to groundwater with less than 10,000 mg/L Total Dissolved Solids (TDS). For metals contaminants, these standards apply to dissolved metals.

NWQCC for Radioactivity: Combined Radium-226 and Radium-228 standard is 30 pCi/L.